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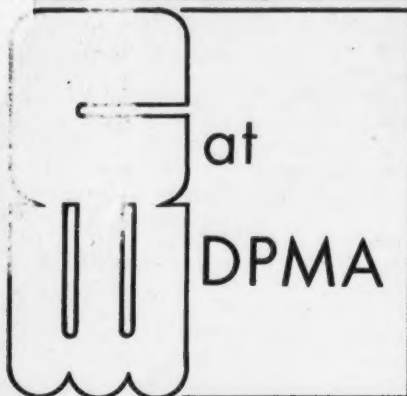
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NEWSPAPER



## Federal-Only Data Law Seen

By Edward J. Bride  
Of the CW Staff

MINNEAPOLIS — Despite the Federal Government's ability to control information practices in the private sector, only government data banks are likely to be included in any laws passed in the near future.

The reason such bills as those proposed by Sen. Sam Ervin (D-N.C.) may not reach the private sector is the lack of confidence in the remedies provided for victims of violations of individual rights, according to Philip W. Buchen, the man



CW Photo by Edward J. Bride

Twins Lisa and Lora Bennett, 10, of Louisville, Ky., try out 1810 data entry system demonstrated at DPMA's Info/Expo by Univac's Winnie Long. Other DPMA coverage is on Pages 6 and 7.

chosen by Vice President Gerald Ford to head the Domestic Council Committee on the Right of Privacy.

Delivering the keynote address at the 22nd annual conference of the Data Processing Management Association (DPMA) here last week, Buchen suggested that because of the interstate nature of big business, "almost everyone" could come under federal privacy legislation.

But the "sentiment in Congress" today is "to proceed slowly" so Congress can get experience at its own level, before passing laws involving the private sector, he suggested.

This is despite pressure from such organizations as the American Civil Liberties Union to make laws more broad, he added.

Buchen also told a press gathering that a Data Inspection Board such as the one operating in Sweden could not possibly be effective in a country the size of the U.S.

(Continued on Page 4)

## New York Forced Out of CCH System For Failure to Update 'Rap Sheet' Files

By Nancy French  
and E. Drake Lundell Jr.  
Of the CW Staff

WASHINGTON, D.C. — New York State has been thrown out of the FBI's Computerized Criminal History (CCH) system after a protracted dispute over updating criminal history information.

Almost simultaneously, another large state — Pennsylvania — withdrew from the system claiming it was too expensive in terms of staff and other resources.

The New York case is the first instance in which a state has been forced out of the system because of a failure to update "rap sheet" information held in the CCH

files, sources indicated.

The removal of New York and Pennsylvania's withdrawal leave only four states participating in the CCH system — Arizona, California, Florida and Illinois — even though a host of other states is currently applying to the Law Enforcement Assistance Administration (LEAA) for funds to enable them to join CCH.

### 'Competing Priorities'

New York "withdrew" from the system because "competing priorities" made the state unable to update the records placed in the file so far, according to Archibald Murray, head of the state's Division of

Criminal Justice Services.

Since the merger of the New York State Identification and Intelligence System (Nysis) into the state's new and larger Criminal Justice Services Division, "we've had to focus on delivering the best possible service within our own systems first," Murray said.

This required reorganization, new staffing and changes in the agency's workload, he said, adding "the voluntary participation in CCH had to take a lower priority."

"There came a time when we indicated to the FBI that we would not be updating our file, and they felt it would be an 'awkward' way to run their system, so our only choice was to withdraw," he said.

However, Justice Department sources indicated New York tried to convince the FBI to let them stay on the system without updating the records and this was rejected by the bureau.

These sources noted the Advisory Policy Board for the National Crime Information Center (NCIC), which contains the CCH files, has established a requirement that all states tied into the system update their records regularly.

The New York "withdrawal" came only after the Advisory Policy Board voted to remove the state from the system for its refusal to update, sources said.

At the same time, Dennis Lofgren, an NCIC staff member, reported earlier that many of New York's updating problems arose because the state used low-speed telephone lines to transmit update information to the NCIC in Washington and these lines could not accommodate the high volume generated by the system.

At the time of its withdrawal from the system, New York accounted for almost 45,500 or 10% of the approximately

(Continued on Page 2)

## Critics Converge on AT&T; 'Strategy' Report Revealed

By Ronald A. Frank  
Of the CW Staff

WASHINGTON, D.C. — The Bell System's strategy in coping with competition is coming under increased scrutiny from several quarters.

Publication of an apparently secret report on Bell plans to counter adverse public opinion, hearings before a Senate antitrust committee on allegations of Bell reprisals against customers with noncarrier equipment, and demands from an industry association that Bell's internal files be opened to the public are all converging on AT&T.

The confidential Bell research report was described by the *New York Times* as "an outline of how the Bell System proposes to guide public opinion..." in the areas of interconnection and competition from the specialized carriers. The *Times* article said the paper had obtained a copy of the "strategy to mold public opinion" which apparently was written by the planning division of Illinois Bell Telephone Co.

According to the *Times* article, the report called for "the intelligent exploitation of every avenue of communication available to us..." The report called for a counterattack on "the kneejerk reaction of most of the public that 'competition' among companies providing products or services is inherently and always 'good.' Our argument asks the public to accept the antithesis of what they have been enculturated to believe," the report said.

### Dissatisfied Customers

On the legislative front, the Senate Antitrust and Monopoly Subcommittee resumed hearings on the communications industry with appearances by several former Bell customers who detailed how Bell had refused to patronize their businesses after they had installed non-Bell telephone equipment.

In one case, a representative from a Houston travel agency said she had been instructed not to book Southwestern Bell employees on Continental Airlines so long as the employees would not be delayed by using other lines. The move apparently came after Continental had switched to a non-Bell computerized automatic call distribution system sup-

plied by Collins Radio, and other customer-provided equipment. However, C.M. Huntley, telecommunications director at Continental, said he had no information about any Bell reprisals against his firm.

James W. Massick, president of Truckweld Equipment Co. of Seattle, told the subcommittee that Pacific Northwest Bell had reduced orders to his firm after he had installed noncarrier telephone equipment.

Hearings before the subcommittee chaired by Phillip A. Hart (D-Mich.) are scheduled to continue this week.

### CIA Seeks Files

Meanwhile, the Computer Industry Association told the Federal Communica-

(Continued on Page 2)

## Separate Centers Funded

## Committee Slashes Teale Budget

By Molly Upton  
Of the CW Staff

SACRAMENTO, Calif. — The Budget Conference Committee of the California Legislature struck a blow to the concept of DP consolidation last week by cutting in half the budget for the Stephen P. Teale Data Center and allowing two departments to continue operating separate DP centers.

The recommendations of the committee were expected to be ratified last week by the legislature, sources said, as the new fiscal year began July 1.

The Department of Motor Vehicles (DMV) was allocated about \$6.5 million for DP work, allowing it to seek a solution independent of the Teale center. Under the original budget, DMV was to receive \$4.5 million with which to purchase services from the Teale center.

Conversion of the DMV records to IBM equipment in the Teale center was not accomplished by IBM by July 1, the deadline date specified in the state's contract.

The firm had acknowledged slippages and in May was quoting Aug. 4 as a probable date of completion.

However, the date currently being discussed is Oct. 11, which is generally considered to be too late to allow the DMV to switch to staggered vehicle registration this year, sources said.

The plan for staggered registration, and IBM's word that it could meet the July 1 deadline, were among the principal reasons for awarding the contract to IBM, state legislative sources indicated.

In addition, the Department of Water Resources (DWR) will continue to op-

(Continued on Page 2)

## On the Inside This Week

'Unisym' Discounts Differences Among Minis — Page 13

Race Is On in Flexible Disk Drive Area — Page 24

Communications .....17  
Computer Industry .....24  
Editorial .....10  
Financial .....38  
Professional Practices .....12  
Software/Services .....13  
Systems/Peripherals .....19





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# IBM Fears IRS Threatened Witnesses

By E. Drake Lundell Jr.  
Of the CW Staff

NEW YORK — IBM indicated last week that the government might be using threats of Internal Revenue Service investigations in an effort to scare individuals who have agreed to testify for IBM in its upcoming antitrust suit.

In a motion filed with the U.S. District Court here, IBM asked the court to order the Justice Department to conduct an investigation into the allegations and to assure the court that such behavior was not taking place.

In a letter sent from Paul M. Dodyk, a member of Cravath, Swaine and Moore, IBM's outside counsel, to Raymond Carlson, the government's lead attorney in the case, the IBM lawyer outlined the background of the case.

He noted two witnesses — Francis W. Winn of Computer Language Research, Inc. in Houston, Texas, and William M. Maroney of the Austin (Texas) *American Statesman* — were contacted by Department of Justice lawyers about their participation as IBM witnesses in the case last May 31.

Just three days later, the letter charged, IRS agents contacted both witnesses and

requested they turn over personal and business records without giving a reason for the apparent investigation.

"The timing and circumstances" of the IRS move "has had an obvious unsettling and coercive impact on two of our prospective witnesses," the letter stated, adding the timing raises a question as to the origin of the IRS investigation.

IBM requested government assurance that the IRS investigations were not related to the case and asked that it be notified if the IRS was planning to investigate any other of its potential witnesses.

## Defense Documents

In other action in the massive suit, IBM is expected to shortly file a motion asking that the case be limited in certain areas due to a refusal of the Department of Commerce to turn over certain documents that IBM has requested for its defense.

Recently the firm indicated such a motion would be filed, noting "the importance of the information which we believe to be contained in the documents withheld. . . We believe such refusal to be inconsistent" with previous court orders

and the government's "obligation to make full disclosure of information relevant to this action."

The Commerce Department has refused IBM access to certain information that the agency collected under the Export Control Act, the Export Administration Act and the Defense Production Act on the grounds that those statutes expressly provide that such information be held in confidence unless there is a finding that such withholding would be contrary to national interest.

IBM has argued that the information should be released since an order in the New York court requires the government to turn over needed information and that "disobedience to orders of a court of the U.S. by the U.S. Government is clearly not in the national interest."

Among the items sought by IBM were all export license applications for computer equipment as well as intelligence reports on those applications, the actual export licenses, investigative files maintained for purposes of enforcing the export control laws of the U.S., and an Industrial Evaluation Board Report on computers developed under the Defense Production Act.

## N.Y. Forced Out of CCH for Lack of Update Data

(Continued from Page 1)

500,000 records on file in the CCH system, an FBI spokesman said.

The names, he added, were simply purged from the disks at the NCIC where they had been held.

In the case of Pennsylvania, the state had 10,739 records on file in the CCH.

Pennsylvania, in withdrawing on May 26, asked the FBI to dump the records onto tape and return them to the state before the disks were purged, but as of last week the state had not yet received the records from the NCIC.

Pennsylvania presently has a manual system for handling arrest records, according to Major Albert F. Kwiatek, director of the State Police Department's bureau of technical services.

All of these records, which number about 2,000 a week, had to be converted for the computerized system, he said, noting the state felt that it was too expensive in terms of people and other resources.

However, Kwiatek indicated Pennsylvania might rejoin the CCH system if federal funding became available for the project. He emphasized that Pennsylvania had been updating the records regularly, unlike New York.

### All Arrest Data

The CCH files include information on anyone who has ever been arrested in any of the participating states, whether or not that arrest resulted in a conviction.

The FBI NCIC Advisory Policy Board required all states participating to update

the records of offenders if the case resulted in a conviction, null process, acquittal or was simply dropped.

However, many critics of the system have noted there is no statutory authority to require such updates and some participants were much slower in updating the records — if they updated at all — than they were in submitting arrest information to the system in the first place.

Several critics have also pointed out that the FBI in some cases ignores its own

policy board directives.

For example, they noted the policy board determined that the CCH file held on a national level should only contain complete information on multistate offenders (persons who have been arrested in more than one state) and just index the names of single state offenders.

However, for operational reasons the CCH file has been keeping the complete records of both multistate and single state offenders, the critics noted.

## 13 States Applying to Join CCH

WASHINGTON, D.C. — Even while two of the largest states in the nation were dropping out of the much criticized Computerized Criminal History (CCH) system operated by the FBI, at least 13 additional states are applying for federal funding to allow them to join the system.

The states are applying for Law Enforcement Assistance Administration (LEAA) grants to develop criminal justice information systems sophisticated enough to allow them to hook into the CCH system.

Those states are Maine, Massachusetts, New Jersey, the District of Columbia, Maryland, Michigan, Minnesota, Ohio, Arkansas, Louisiana, Oklahoma, Utah and Idaho.

Presently, two of the remaining four participants in the CCH system — Arizona and California — receive heavy LEAA funding to permit their participation in

the system, with only Florida and Illinois footing most of the bill for the system themselves.

The whole idea of a CCH-type system developed originally from an LEAA-supported study, Project Search, which had recommended going ahead with the development of a national system, but strongly recommended against FBI management of the system and recommended strong safeguards to protect information in the system.

## Year-Old Records No Longer Shared

WASHINGTON, D.C. — If you were arrested more than a year ago, the FBI will no longer share that information with banks or state and local governments unless the file contains updates on the outcome of the case.

FBI director Clarence Kelley said last week the agency would no longer supply arrest data to such institutions if it was more than a year out of date without information on the outcome of the case.

The new policy, which went into effect July 1, will not apply, however, to the distribution of arrest records to state and local law enforcement agencies, Kelley said.

## Critics Converging on Ma Bell

(Continued from Page 1)

tions Commission (FCC) that its upcoming Docket 20003 on the economic implications and customer practices relating to interconnection should be accompanied by "detailed document discovery from [AT&T] files . . . to deal adequately with the issues.

"All documents other than trade secrets narrowly defined should be put on open file," the CIA told the FCC. "The scope and nature of the Bell System's determinations and policies on competitive issues can fully be determined only by examining [Bell] records."

Bell's objections to release of its business documents "should be put aside," because the company's desire for privacy and secrecy on critical aspects of its business are insufficient, the CIA comments said.

The suggestions were made because "computers and communications are increasingly linked," and all aspects of the computer business are directly or indirectly affected by access to phone company facilities and services, the association said.

## Committee Slashes Teale Budget

(Continued from Page 1)

erate its Control Data Corp. equipment and serve certain agencies.

The conference committee did not allocate to DWR the scheduled \$3.5 million for conversion of its programs to IBM equipment in the Teale Center, as it was determined the move was not cost-effective.

The conference committee cut \$12.1

million from next year's budget, leaving \$11.5 million for the Teale center. The move effectively cut \$7.9 million out of funds scheduled to go to IBM next year, sources said.

Instead of serving about 34 departments with a budget of \$23.5 million, the Teale center will serve about 20 departments with a budget of about \$11.5 million, according to the budget submitted by the committee.



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# Senate Determined to Pass Privacy Bill This Year

By Nancy French  
Of the CW Staff

WASHINGTON, D.C. — Although legislators who will bring to the Senate floor bills to guarantee the individual's constitutional right of privacy have not agreed on the feasibility of including commercial as well as government data banks under the proposed law, they seem determined to get some kind of a bill on the President's desk this year.

Urging all testifying at an ad hoc Senate Subcommittee hearing on privacy legislation to speak their minds, Sen. Edmund A. Muskie (D-Me.) said, "The committee is not wedded to a single bill; we are interested in compromise to get the best possible bill passed this year."

Testimony was heard from all sides of the data privacy issue, including former Attorney General Elliot Richardson; Hope Eastman, representing the American Civil Liberties Union; Alan F. Westin, professor of public law and government, Columbia University; Philip W. Buchen, executive director, Domestic Council Committee on the Right of Privacy; Vincent P. Barabba, director of the Bureau of the Census; Richard M. Schmidt Jr., general counsel, American Society of Newspaper Editors, and many other representatives of state governments and computer users.

Richardson, who as Secretary of Health, Education and Welfare established the HEW Advisory Committee on Automated Personal Data Systems, said it is now too late to consider whether records should be kept on individuals — governments could not function without such records.

"The objective of a policy to protect personal privacy as it relates to information management should... assure that [the individual] can participate in determining how he will be affected by the creation and use of records."

Richardson said he supported legislation that would apply only to federal agencies and state and local governments whose

information management functions served federal programs.

"When the Congress finds 'prima facie' evidence of abuses" on the part of private industry, only then should "Congress take action toward developing additional legislation," he said.

## Circle of Freedom Threatened

On the other hand, Eastman said, "our Constitution guarantees to each of us a circle of freedom into which the government may not venture. Yet the increasing tendency of government and private institutions to collect and disseminate data on individuals threatens our ability to preserve that circle of freedom."

"We strongly support legislation which will require that a system's impact on privacy... be assessed and submitted to the Privacy Board before any organization launches a new information system or expands an existing one."

Such a statement "should include consideration of the reason for the program; of the potential harms to or invasions of the privacy of individuals; of controls on access, transfer, confidentiality and accuracy; of those problems which cannot be avoided; and of alternatives," she said.

Westin made three major points to the committee:

First, that 1974-75 is precisely the right moment for Congress to develop and enact such legislation because before 1972 or '73 even "experts" were ill-informed about how computers were being used, what problems they posed and what kinds of regulatory responses were appropriate to the realities of the situation.

Second, any delay beyond 1974-75 could be extremely dangerous because it would assure that a large number of major data systems will be built that will make it extremely costly to alter the software, change the file structures or reorganize the data flows to respond to national standards.

what was known about him and over who knew it."

Reporting on his group's work, Buchen said the full committee — which includes six cabinet members and heads of four



CW Photo by Edward J. Bride  
Philip W. Buchen

executive agencies — will have an "initial set of recommendations" from its staff to consider at a July 10 meeting.

Because of the short time for preparation — only four months — Buchen admitted the proposals "certainly will not reflect all the thinking and studies which could fruitfully be brought to bear on the subjects treated."

# Davis Warns of 'Technicalities'

WASHINGTON, D.C. — Although computer manufacturers were not directly represented at the Senate subcommittee hearings on privacy legislation, Ruth Davis appeared to present their views.

Davis, director of the Institute for Computer Sciences and Technology, National Bureau of Standards, dealt with the costs and feasibility of actually implementing legislation advocated by privacy proponents.

Davis cautioned that "it is an empty exercise to pass legislation that is technologically impossible to implement. Similarly, it is just a technological tour-de-force to design equipment or procedures that are too costly to use," she said.

"Until recently, the computer industry had devoted a relatively low level of effort to the problems of privacy, data confidentiality and computer security... because there was little demand for computer security outside of specialized applications in the defense and intelligence communities," Davis said.

"In the past year, computer manufacturers have begun to look quite seriously at privacy and computer security," she said, citing the \$40 million IBM Security Study.

Explaining to the committee the difficulties and expenses involved with safeguards such as restricting access to

a system, voice prints, signature reading, hand geometry and fingerprints, Davis said, "We cannot be certain they are technologically feasible or can be operationally effective at an acceptable cost."

With respect to controlling access, "the technical problem begins to escalate if you wish to apply confidentiality tags within a file as for example, to a person's age, but not his job qualifications, or to data which is less than six months old but not if it's older, or to data which is to be accessed only if certain prescribed conditions are met."

With regard to building a record of all persons who have access to a file, the second principal legislative requirement, Davis said, the question of technical feasibility rests heavily upon a number of factors:

- How many persons will exercise the right to see the record of access and how frequently?
- How detailed must the record be? Would it be sufficient to simply record access to the file containing the individual's record, or must there be a record of what specific data in the record was accessed?
- How quickly is the system manager expected to respond to a request to seek the record of access — immediately, two days, three weeks?

Third, it is critical for Congress to develop an approach that will reflect the realities, problems and opportunities posed by computer and communications technology; will be practically useful to the average citizen and his/her group representatives; and will strike the right balance between federal and state jurisdiction, government and private sectors and compulsory versus voluntary standards.

"It is essential that one national set of safeguards be instituted, but I cannot see that such a federal preemption would be a wise policy for those local and state data systems that are basically localized in nature," he said.

Speaking for Vice President Gerald Ford, Buchen urged that legislation be confined "to information practices of the Federal Government rather than reaching at once into state government operations or into private business... Then after experience is gained, further legislation can be passed to expand effective application of those principles to additional federal information systems and, if necessary, to ones outside the Federal Government."

Barabba emphasized the need to "distinguish between statistical and administrative records systems." Though both may contain similar information, administrative records are intended to affect the individual directly, whereas statistical records do not affect individual privacy when used solely for the compilation and analysis of aggregate data.

Barabba recommended for inclusion in a bill an exemption for records collected and used solely for statistical purposes or as authorized by the U.S. Code.

The right of the individual to correct his own file, a key point in all proposed legislation, would bring "endless interruption and hopeless frustration to the production and dissemination of statistics, with very serious results as to the timeliness of data," Barabba said.

Richard Schmidt, who spoke on behalf of the American Society of Newspaper Editors, urged legislators not to allow the language of a privacy bill "to limit press access to what has always been considered to be public information on file with the government."

Schmidt cited a privacy law enacted recently in Hawaii, which provides that "all law enforcement records relating to the questioning, apprehension, detention, arrest or charging of persons for or in connection with a criminal offense, against whom no conviction is secured, shall be deemed confidential and shall not be disclosed..."

The subcommittee also heard testimony from state officials, the National Legislative Conference, a health data expert and the League of Women Voters.

Representing the legislative conference, Ohio state senator Stanley Aronoff accused retail interests of sabotaging a privacy bill in the Ohio legislature through "feverish lobbying."

## Correction

The basic small Univac 90/30 will cost about \$3,750/mo or \$143,760 purchase [CW, June 26].

# Buchen Predicts Government-Only Data Bank Law

(Continued from Page 1)

Instead, he echoed the Vice President's recommendation that all new information systems should be preceded by a privacy impact statement; because of the short life of many data banks, according to Buchen, nearly 80% of all federal data banks could have had such a preinvestigation within five or six years.

## "Management Uncertainty"

The keynoter also observed the many different bills in state and federal committees are probably bringing "some threats or uncertainties about what tomorrow may bring in your management of data systems."

And the privacy problem is compounded by computers which have replaced the "face to face" environment surrounding dealings between people, he added.

"Reputed or observed personal circumstances and attributes of character, ability, beliefs or behavior inevitably influence how people regard and treat one another."

"But it was easier to cope with such influences and to overcome wrong impressions or frustrating consequences when person-to-person discussions and appraisals were the usual basis of transactions between people," he added.

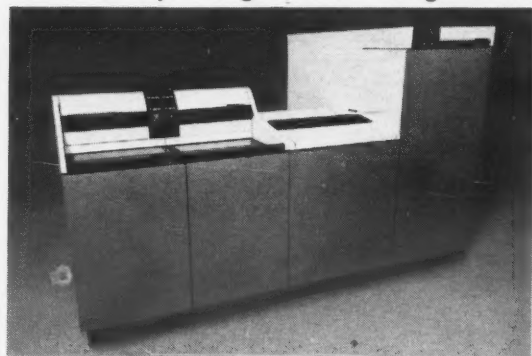
As the social group became "too large for mutual contacts and appraisals, and as communications went from word-of-mouth to written statements, and from written statements to automated coding, storage and dissemination or retrieval," he continued, "man lost control over





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# MEMOREX



# Emphasis in DP Now on Human Resources Utilization

By Toni Wiseman  
Of the CW Staff

MINNEAPOLIS — The emphasis in data processing today is on the effective utilization of human resources and how it affects company operations as systems are implemented, according to Ken McReavie, a consultant with Peat, Marwick and Partners, Toronto.

The first step in recruitment is to define your needs, he told DPMA's Info/Expo attendees last week, and establish the technical requirements, such as job and company objectives, skills, experience and education, as well as behavioral characteristics, such as personality traits and interpersonal relationships.

Policy matters, including job classification, salary range, fringe benefits and manpower plans, as well as urgency/timing and selection criteria, should also be considered.

Internal manpower is the optimum source of candidates to fill a vacancy, McReavie said, followed by word-of-

mouth information and knowledge of people in the industry.

Advertising and outside agencies trail the list of potential sources, McReavie said, with executive search firms to be considered "only as a last resort."

## Progressive Refinement

Once the job definition is completed the screening process begins. This should be viewed as a progressive refinement of the list of candidates, he stated.

Screening consists of four "levels" — the initial screening which is a resume review and interview; the second level where technical reviews, tests and reference checking take place; and the third level which consists of multiple meetings with various members of the organization, including a representative of the user department.

The final step is a new psychological tool known as the assessment center approach, McReavie stated, consisting of group leadership discussions, management

exercises and psychological games.

The important step at the end of each "level," he emphasized, is appraisal and

feedback which is, in essence, a candidate's ticket to the next level.

In reference to tests, McReavie noted that according to an independent study 91 companies had employed some kind of intelligence test and 458 used either the IBM PAT or NCR E51 aptitude tests, while less than 10 firms used either personality or interest tests.

Serious pitfalls exist here, however, he cautioned, listing degree of validity (influenced by the similarity of the candidate's characteristics to those of the group involved in developing specifications), the administration of the tests, the familiarity of individuals to testing and the legal ramifications, such as cultural or racial bias.

The final selection should be based on the predetermined criteria for selection, appraisals of face-to-face interviews, the correlation of appraisals to criteria and finally a decision by the selection board and management, McReavie said.

"It is interesting," he noted, "that the items supervisors rated as most important in appraising a candidate for a job were dropped to least important in measuring his performance once he had been on the job for a while."

Once a candidate has been selected, management's job is to keep him, McReavie said, to keep him motivated to work.

After the worker has achieved some level of satisfaction, he said, the motivating action becomes important. Factors here include achievement, recognition, personal growth, advancement and increasing responsibilities.

Work simplification, meaningless work or increased quantity of output are non-motivating, McReavie said, and will only thwart management's objectives.

"The objective of selection and control is to blend individual and company goals to benefit both," he concluded.

## DPMA Says Yes to Afips

MINNEAPOLIS — As expected, the International Board of Directors of the Data Processing Management Association (DPMA) last week voted to back the DPMA application for membership in the American Federation of Information Processing Societies (Afips).

The board's action came at the organization's annual conference, which attracted around 1,800 attendees and 30-odd exhibiting companies here last week.

The Afips board has already had one favorable vote on the DPMA application and will vote for a second time this November at a meeting in San Diego, Calif. It is expected that the application will be approved then.

## On-Line S&L Money-Handling Network Possible

By a CW Staff Writer

MINNEAPOLIS — It would not be unexpected in the foreseeable future for all savings and loan associations (S&Ls) to band together and set up an on-line money-handling network of their own, Don Barney, vice-president and manager, Information Systems Division, Glendale Federal Savings and Loan Association, told a session on point-of-sale (POS) systems at a DPMA session here.

Such a system would probably consist of some 200 automatic teller terminals which anyone could use, he added.

There are over 5,000 S&L's, and they are heavily regulated. They all offer the same product for the same price, so the question becomes one of better customer

service, Barney said.

Barney predicted a strong trend toward automatic tellers and shared facilities, as well as a nationwide asset and credit system similar to BankAmericard.

Barney referred to two recent POS experiments. The first is the Hinky Dinky/First Savings and Loan of Nebraska relationship which has been ended due to legalities.

"This didn't run too long so statistics aren't too good," he confided, "but 90% of the loan customers and 60% of the savings customers had plastic cards which allowed them to conduct all their banking needs at the grocery store, at terminals operated by store personnel," Barney said.

Another operation, which is still running, is the cooperative venture between Western Savings and Loan and Smitty's in the Phoenix area.

The difference here, Barney noted, is that Western filed for branch applications, and the agreement is that Western cashes all checks within the confines of the store at terminals run by bank people instead of store personnel.

Smitty's has eliminated 80 man-hours a week spent on check-cashing operations and reduced bad check losses to nil since all losses are carried by Western.

Western, on the other hand, has opened what amounts to a new facility for the low cost of \$35,000 which includes modems and terminal, Barney noted.

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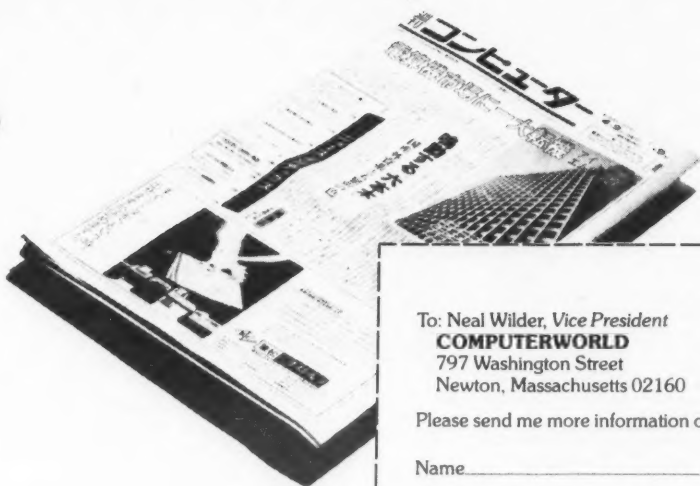
- Initial circulation is guaranteed at 35,000, divided about 80% to end-users and 20% to the computer industry. Circulation development methods currently under way are the same as those which gave *Computerworld* the highest paid circulation in its field in less than four years.

- **Shukan** lets you in on the action in the world's fastest growing EDP market. The Japanese Ministry of International Trade and Industry (MITI) has made the following 1976 forecast: 39,000 general-purpose systems installed, up from 11,237 in 1971; 11,000 minicomputers installed, up from 1,670 in 1971; and 3,000 industrial systems installed, up from 1,086 in 1971.

- Is this growth likely? The latest census of general-purpose systems revealed that there were 14,806 systems installed as of September 1972, a one-year gain of 3,569 units and \$911 million installed value, a growth of 31.7% and 23.1% respectively. And more than 50% of these new systems were American made.

- It is true that there are import restrictions. But Japanese vendors and users can get permission to import almost anything they want and need. As a result, 1972 imports were over \$360 million.

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## Small System Success Depends On Right 'Who Runs It' Choice

By Nancy French  
Of the CW Staff

MINNEAPOLIS — A key to getting your money's worth out of a small- to medium-size data processing operation is assessing correctly whether to "let somebody else do it" or whether to "do it yourself," according to four speakers at a DPMA session here.

"Knowing thyself" and understanding one's needs is the first step toward making the choice, said William R. McArthur, MIS manager for MTS Systems Corp. here. The user must be aware that the key to success is "managing change, not technology," he added.

### CW at DPMA

If "you can justify hiring data processing expertise, if you anticipate growth, if you want to develop and manage a data base and prefer to control your own resources, thereby minimizing costs, then you really should 'do it yourself,'" McArthur observed.

On the other hand, commented Bruce Banister, a consultant specializing in small business systems, if "your company exhibits a limited knowledge and interest in data processing, equipment selection and answers to problems; if you cannot justify the necessary staff to start up and operate an in-house system; or if it's urgent for you to get a system up right away, yours is a job for a consultant or facilities management team."

#### Obstacles, Rules

On the "do it yourself side," both McArthur and Patrick M. Finley, treasurer at Contech, Inc., described the pitfalls they

encountered and guidelines they established setting up in-house operations.

"In a small shop you'll need a few people who can serve in multiple functions," McArthur said, adding it is advantageous to give the computer programmer/systems analyst a chance for greater challenges and real "hands on" experience he wouldn't get in a large installation.

"Pay them well, challenge them and keep them," he said.

"To assure project control, take small 'bite size' steps — avoid large schemes," he warned.

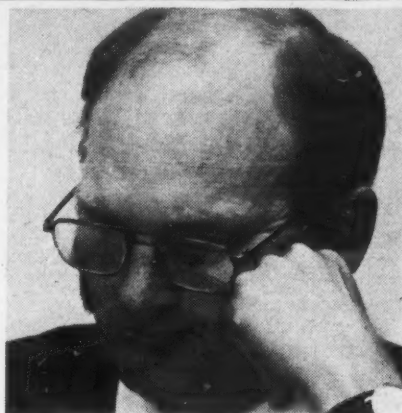
Finley echoed McArthur's views in describing the experiences of his company. After six months of operating with one keypunch machine and an operator, and farming DP functions out to three different service bureaus, the firm decided it needed to consolidate the DP effort.

It needed to continue accounts receivable, sales analysis and inventory control without interruption, he said. Early on it was decided to continue with payroll out-of-house.

Faced with a choice between IBM and Honeywell, "we chose the Honeywell 58 system because IBM promised to do everything for us. Honeywell wanted our people involved and would not sell the system without getting a commitment from Contech to do its own programming."

The company decided it wanted that capability in-house, so it went to Honeywell. "Our biggest problem was with our electrician," he said. "When we brought in the computer we found we had Delta service, and the computer needed a Y-type system. So for three weeks we had the computer sitting there idle," he said.

John Knauff of Rosemount, Inc., a Min-



Bruce Banister



Patrick Finley

CW Photos by Edward J. Bride

neapolis-based "resources management" firm, urged attendees to consider the "let somebody else do it" approach in managing a business.

Defining resources management as a concept which utilizes facilities management as a tool, the director of material and systems explained that only a firm providing a complete range of services and systems capabilities should be called a resource management firm. This does not include turnkey software houses or

service bureaus by definition, Knauff claimed.

Before going to this concept, he urged attendees to know "why" they are taking that approach to the management of their businesses.

Once the firm has assured a high level of management skill in systematic thought, committed the financial resources, is willing to commit the people and equipment resources, the chief executive officer should determine the firm's readiness.

## Management Isolation Has Cure

MINNEAPOLIS — "A credibility gap, born of cost overruns and unfulfilled expectations, has separated data processing from top management today," John Soden, a McKinsey and Co. consultant, told DP managers here.

"Top management has abdicated responsibility for the information processing function because they can't understand it, and can't relate to it," Soden stated at a DPMA session.

If your boss is "leaving you alone" you're not doing your job, according to Soden, because he isn't getting the input he needs to make management decisions

about the DP function in the company.

Soden suggested remedies for this management malady:

- "Establish communication with key people in your company. A lunch list is a good method.
- "Develop a broader understanding of your organization, and make your boss' problems your problems.
- "Submit regular progress reports — at least monthly — so your manager knows what you're doing.
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## Ground Transport Erratic

## Still Not Fully Accepted

# Airport System Has Trouble Getting Off the Ground

By Patrick Ward  
Of the CW Staff

FORT WORTH, Texas — Six months after opening for business, the "world's biggest airport" is still having teething troubles with its computer-controlled ground transportation system.

About 40 rubber-tired trains, dubbed the "Airtrans" system, are now circling 13 miles of track at the Dallas/Fort Worth Airport, shuttling passengers from parking lots to terminals and from one airline to another, but they have acquired an unsettling reputation for stopping suddenly in the middle of nowhere. And the computer-controlled audio system advising passengers the vehicle is pulling into a particular station has a tendency to do so when the station is still several stops away.

For these reasons, the system, which was developed by LTV Aerospace Corp. to run without human operators, still has not been formally accepted by the airport a year after the original target date.

The scheduling of surrounding airport construction had been "way off base," contended Austin Corbin, Airtrans program manager for LTV, and this interfered with Airtrans work.

"Of course, the system couldn't have been accepted at [the original target date] because the airport itself wasn't finished," he explained.

For a three-month stretch, LTV had technicians riding the vehicles both as a public relations gesture and to overcome some of the cars' "nervous reactions."

Technicians are still riding in the more sophisticated Airtrans cargo system that

carries baggage, mail and trash around the airport.

D.L. Leftwich, the airport's Airtrans control administrator, said the unexplained stops have gone down 50% since the airport's opening in January, but the software-controlled audio announcement system has been a major problem.

Corbin traced the problem to an "attempt to use commercially available eight-track tape transports which I guess aren't good enough for this application."

A third computer-controlled system displays an incoming vehicle's destination to passengers waiting in an Airtrans station. Both Corbin and Leftwich agreed this has worked well.

For the Airtrans system to be accepted by the airport, Leftwich observed, there must be at least 65 operational cars, but modifications to correct the system's problems are keeping down the number available for service.

In spite of the delays, said Leftwich, "we're making very good progress" in resolving the problems, which are "normal for a sophisticated system such as this."

Corbin said he hopes for full acceptance within three months.

Six Modular Computer Systems Modcomp 1 minicomputers control the Airtrans system. The cars have hardwired logic units which communicate through a signal rail by means of relay sensors in the tracks, Corbin explained.

Five 16K substation CPUs collect this data and communicate with a master system that now has 64K, rather than the 32K originally planned.

The unexplained stops came from the fact that there are two main control systems affecting the vehicles, Corbin observed. There is a safety system that stops the car when it senses a problem and can't be overridden, and a movement

system that controls the running of the cars.

Not only software bugs but loose wire connections in control devices are enough to halt the vehicles, Corbin noted.

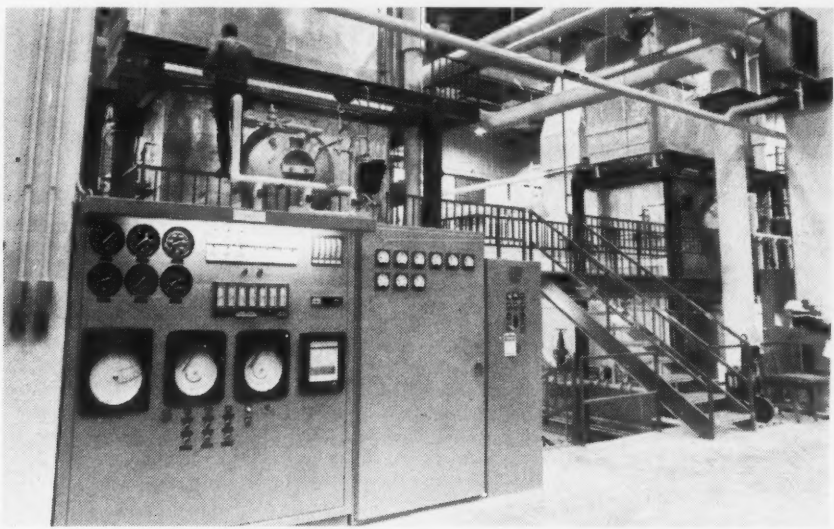
Computerization reaches into the giant airport's central utility plant, where a 32K Modcomp 3 minicomputer with a 1.2M-word moving head disk monitors data from over 900 sensors.

The system, backed up by another Modcomp mini, sounds alarms when variables in the huge heating and cooling systems pass set limits.

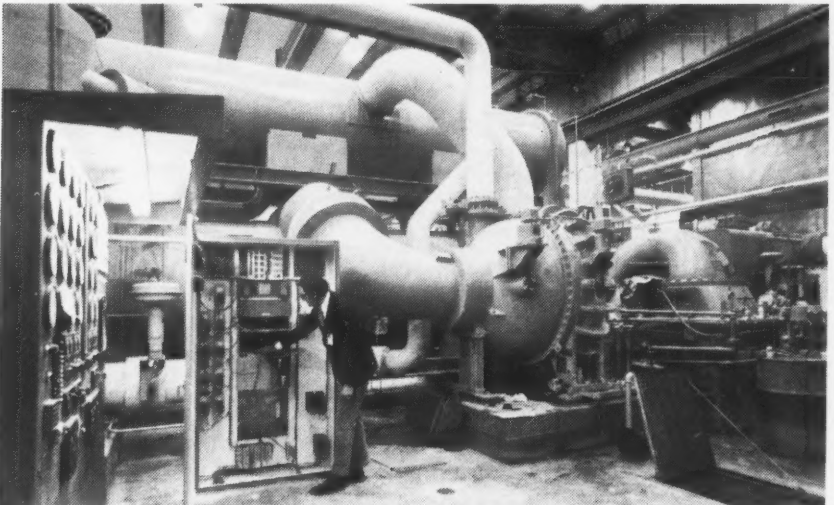


Photos by Alton Swett

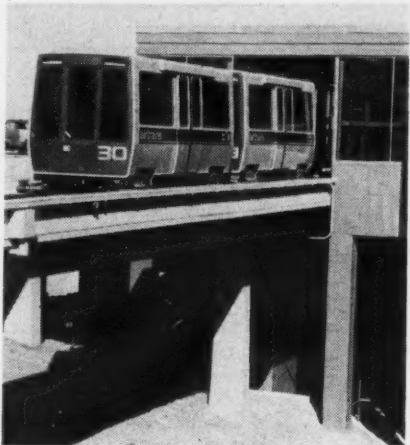
Dual CRTs, one backing up the other, sit in the middle of the central control console. On each side are screens showing schematic diagram slides that provide quick reference to utility plant layout for less experienced staff.



Nine gauges mark the cover of a remote terminal unit that collects sensor data and is polled by the minicomputers. To the left is a boiler's operating panel.



The inner workings of a remote terminal unit stand revealed.

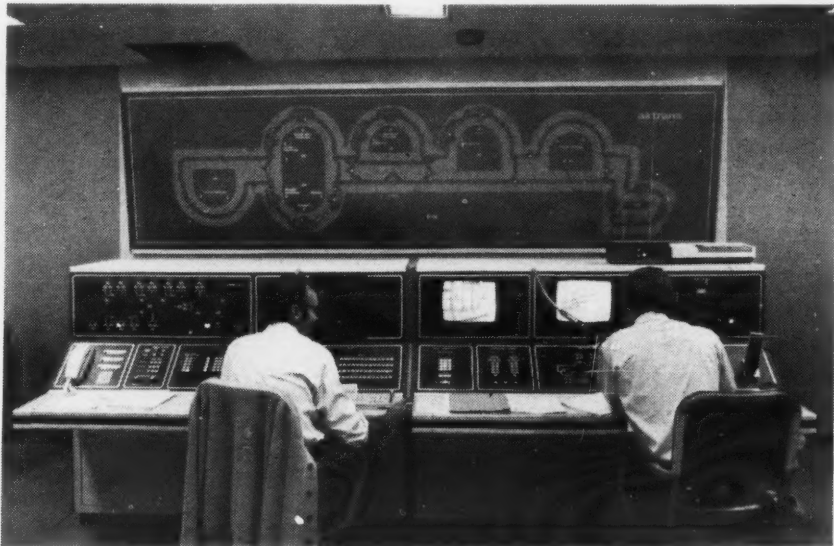


Airtrans car pulls into hotel station.

Beyond this, the automated system provides the utility plant's historical data storage and retrieval and does billing data collection.

The computer system also produces a daily summary of the plant's operations.

Supervisor of utilities Al Utesch credits the computerized system with allowing a staff of only 10 workers to run the over \$17 million plant 24 hours a day, seven days a week.



Staffers at the Airtrans control station keep watch for "nervous" trains.



The world's largest airport, appropriately in Texas, relies on the computer-run Airtrans system to move people, baggage and cargo around the 27-square-mile airport. A computer system also monitors the \$17 million central utilities plant that serves the airport.



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## Editorial

### Just So Many Empty Words

Can it be that increasing competitive pressures on the Bell System are leading the nation's largest common carrier to use ambiguous tariffs for its own benefit?

The question is a serious one and probably has no easy answer. And yet increasing incidents have occurred in which AT&T spokesmen have released answers to tariff questions which were completely reversed several days later.

Officially, AT&T explains these cases by saying those who gave out the original information may not have had all the facts. And it is understandable that in a large organization internal communications can pose a problem.

Nevertheless, a common carrier has every opportunity to hide behind a cloak of regulatory immunity — at least as far as interpretation of its tariffs are concerned. The entire relationship between the carrier and the Federal Communications Commission (FCC) leaves much to be desired. For it is the carrier that initiates the tariff, it is the carrier that then applies the tariff, and it is the carrier that interprets the intent of the tariff to the user.

The FCC comes to question the intent of a tariff only when a specific problem is brought to it or a proposal is unclear to its staff members. The former case happens infrequently.

Although many users do speak up, the majority of phone customers are ready to accept tariffs as they are interpreted by the carrier. Firms in competition with AT&T do question and probe the intent of tariffs but usually their motivations are geared to protecting the competitive relationship rather than looking out for the rights of the telephone customer.

The latter case is rare simply because the FCC staff, like any other government agency, can only devote a limited amount of time to make in-depth analyses of tariffs originated by AT&T.

It is against this background that AT&T has become increasingly fluid in interpreting its own tariff requirements. On several recent occasions, Bell has reversed itself in questions concerning its equipment or services, and in each case the reversal appeared to correct an apparent discrimination against the user of customer-provided equipment.

The latest example involves an AT&T statement that the user of a noncarrier 9,600 bit/sec modem must pay for service terminal installation when upgrading a Type 3002 line to include D1 conditioning. Originally an AT&T spokesman had said a user who upgraded to Bell's 209 modem with D1 would not pay for the \$100 service terminal installation, while the charge would apply to the independent modem user.

This story was then corrected to point out that all installations of D1 conditioning would have to pay the \$100. (See story Page 17.)

Other cases where original data from AT&T has been updated with new information includes the Dataphone Digital Service, the Bell 209 data set charges for multiplexing, and the interpretation of new Wats rates.

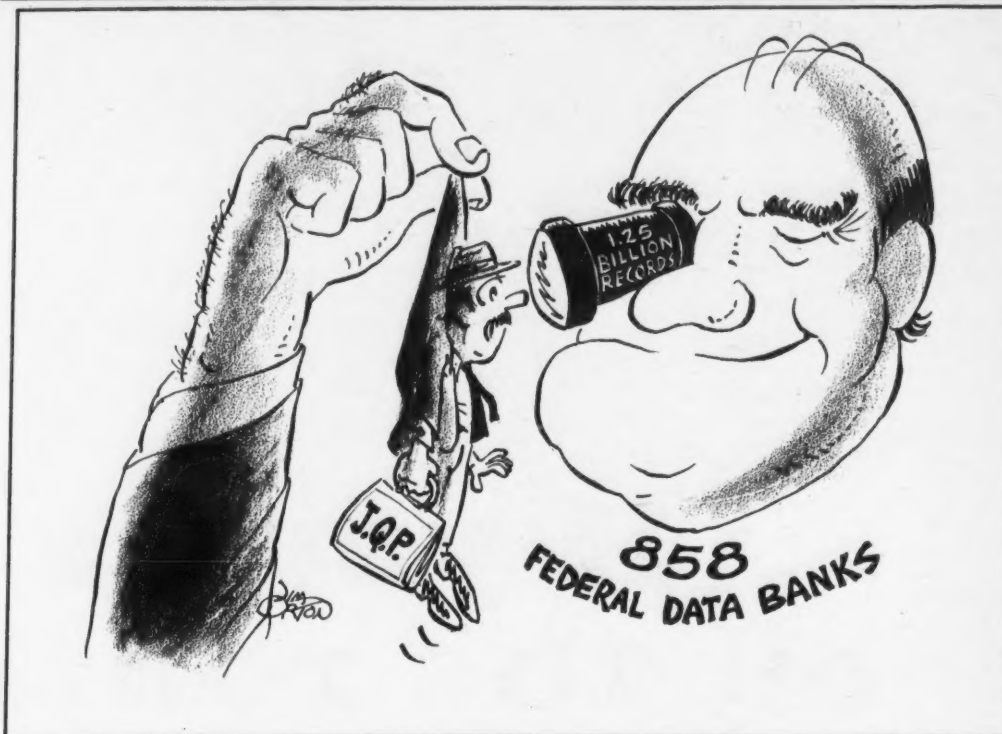
The key question in all these cases is really not the intent of the Bell System and/or AT&T. It is instead the intent of the regulatory process.

If tariffs written by a regulated carrier are designed to apply equal services at equal rates to all subscribers, then there can be no room for ambiguity. What makes this situation so much worse is that the smaller user is (as is so often the case) at a disadvantage. The volume discounts available to large users are out of reach of the majority of small subscribers.

The large user is served by a Bell national account representative. He can call this representative and usually get clarification of a tariff question (or benefit) in short order. But a small user gets no such favored treatment. Often he must interpret the tariff regulations for himself.

Even if we give the common carriers the benefit of the doubt and assume that many tariffs are unintentionally written in an unclear manner, there is no excuse for this situation to continue.

A carrier must not be allowed to take advantage of the regulatory process for its own gain. As long as this practice continues, the FCC order calling for full and fair competition between AT&T and noncarrier vendors will be just so many empty words.



Eyeball to Eyeball

## Letters to the Editor

### Cobol for Minis Would Be Boon To Distributor With Foresight

I endorse the theme of the editorial "Minicobol, Now!" [CW, June 19]. It seems ironic that such an alleged leader as DEC would (a) have to pick up Cobol from a foreign country, (b) seem reluctant to promote it among its users and (c) fail to recognize that availability of Cobol would be an added stimulus to its marketing.

Since building Cobol compilers is my favorite for-pay endeavor, I should like to state unequivocally for the record that it is not difficult to fit a minicomputer with a good Cobol capability, within 12K 16-bit words, in a time span of six months — provided the manufacturer contracts with people who have a proven record of accomplishment in the field of Cobol compiler development.

One question remains to be answered: How good is the Australian product?

Ken Seidel

Fallbrook, Calif.

### Network Management Center Not Based on Modem Choice

Regarding the user casebook article on the Xerox Computer Center at Webster, N.Y., which appeared in the June 12 edition, I would like to clarify several points.

In discussing the network control center feature, I indicated the design of our data processing system required a methodology for trouble isolation and service restoration in a multivendor, multidiscipline environment. The decision to include a network management center (technical control center) was a design decision which was not predicated on the choice of modem. The network management center was specified as a complement to the computer hardware and was not dependent on any predetermined modem choice.

Additionally, I indicated the choice of lines was a half-duplex 4-wire facility. We are paying half-duplex rates but we have full-duplex facilities.

Finally, I should point out that the opinions expressed in the article reflected my personal viewpoint only, and should not necessarily be read as those of Xerox.

Thomas H. Bowne

Webster, N.Y.

### Honeywell as Moral as Grosch

As a private citizen, Herb Grosch had the right to express his views to James Binger of Honeywell. It was not appropriate, however, to publicize them in *Computerworld* as you did in the April 24 issue.

Further, his comment on the need, and value, of businesses to be moral as well as enterprising does not exactly come as a great revelation. The sugges-

tion that top managers are more motivated to be unethical than middle managers and technicians would be laughable were it not for the possibility that someone might believe him.

In making such statements not only does he display a genuine lack of understanding, he insults a large segment of CW's audience and unjustly does harm to one of the few companies making a meaningful contribution to the computer industry. I submit that Honeywell and its management are every bit as moral — and ethical — as Grosch and CW. But perhaps that depends on your definition of morality and ethics.

J.W. Cannon

Edmonds, Wash.

### Let's Decode Spin Numbers

First, my belated congratulations on Herb Grosch's Honeywell column. All its points were well taken, particularly the fact that Honeywell is losing out on a lot of talent due to its unyielding corporate stance.

Second, I'd like to suggest that *Computerworld* explore further some facts revealed on the recent ABC special "The Paper Prison."

That special not only uncovered, but put an immediate end to, a Defense Department policy of classifying each honorable discharge with one of 500 distinctive Spin (acronym unknown) numbers. The point of the special was that the dischargee wasn't told what his particular number stood for, though several of the nation's largest employers (including Honeywell) were.

Thus, more than half a million veterans were assigned codes — devised by computer programmers — which affected their lives without their knowing how and without any ability on their parts to do anything about it.

The Spin numbers stood for such subjective categories as "lazy," "below standard performance" and "lack of initiative"; columnist Herb Caen noted one male veteran whose Spin number translated to "pregnant WAC."

I'd like to suggest that CW obtain a list of these Spin numbers (maybe from Honeywell) and reprint them as an example of how data processing procedures, people and principles can be abused.

James Bunker

Hayward, Calif.

### Thanks to America's Defenders

I support the point of view expressed by G.F. Herndon in "What's Wrong With Aiding the Defense of America?" in the June 12 issue.

It is to CW's credit that the item was published in light of its apparent editorial policy.

Gary L. Hammon

Austin, Texas

The views expressed in the column *Black Hats/White Hats* are the personal opinions of Herb Grosch and do not represent the official editorial policies of *Computerworld*. Ed.



## Letters to the Editor

### Certification Unfair To Minority Groups

Again we find Alan Taylor's columns advocating certification programs for data processing professionals.

I think this concept should be challenged.

Our specialty has been one of the "fast tracks" for non-college educated people. Written testing usually creates a cultural bias against those of more limited education.

I have had the pleasure of working with many data processing "pros" who ended their formal education at the high school level.

Inevitably, a certification program requires a years-of-experience credential and just as surely part or all of that requirement will be waived for those with appropriate college training.

This will slam the door for many persons in the job market. Blacks, women and those of limited education have created an enviable record in our field. Our rewards for ability alone have allowed us to enjoy the talents of many excluded by other disciplines.

Why certification? Usually the reason is to protect an unwary public from those with insufficient skill.

Our field is not in the marketplace affecting consumers. Businesses should be able to evaluate candidates without this crutch.

Certification is a threat to many of our coworkers and po-

tential coworkers. It is time for deemphasis of certification as a goal of our specialty.

Al Smith

Senior Financial Analyst  
GAF Corp.  
South Bound Brook, N.J.

### Who Will Retrain Displaced Workers?

In regard to the editorial of June 12, entitled "Storm Warnings," it has been said that management problems are now solvable through systems analysis. Is it not possible to approach social problems in the same manner?

If a middle-aged worker wanted to learn a new skill, what avenues are open to him? Whose responsibility should it be to see that he doesn't become displaced in society? If his employer replaces him with a machine is his employer willing to help him find a new place in society? Should the Federal Government provide assistance to employers for such a program? Surely men and women are not useless in their middle years. Indeed, some feel that the middle years are the very prime of life.

It should not be necessary for people to have to start all over again in their middle years. Surely by that time in their lives, they have attained some knowledge and skill just from living!

There is an educational and economic gap. Surely a nation as great as ours can find the solution to this problem.

S.A. Rummage  
Systems Analyst

Ferris State College  
Big Rapids, Mich.

## Papeete

I can't do it!

Can't hold the long-awaited meeting of the Polynesian Information Processing Society (Pips), that is. I've been looking forward to this through years of European, Californian and bureaucratic exile — looking to my second Tahitian visit and the second meeting of Pips.

I founded the society, and became the only voting member, back in 1960. Herb Robinson had just run me out of CEIR for telling him Stretch wouldn't fly, and I was en route to the first Australian computer meeting.

Problem is, the bylaws state that meetings shall be held "in Polynesia," and the Pips constitution defines Polynesia as "those islands of the Pacific between 40 degrees north and 40 degrees south latitude not having an IBM office."

And, shattering every yachtsman's dream of an earthly paradise, there is an IBM office in Papeete. I have in my hand a certified copy of a letter which, translated from elegant French, says: "I the undersigned Herve d'Hauthuille, technical-commercial engineer, attest the real and concrete existence of Agence IBM-France in Tahiti (Papeete)."

Turns out this is the "largest" IBM agency. Its base is in Noumea, New Caledonia, and its two branch offices ("Sous-Bureaux") are in Papeete, 4500 km distant, and Phnom Penh, 8000 km away. What a sales territory!

There are five 360/20 machines installed here, and three 370s on order. And of

course, many typewriters. The key customer is CEA, *Commissariat a l'Energie Atomique et du Centre d'Essais du Pacifique*. Like the AEC in Vegas but much, much more out of place.

Anyhow, IBM has been here since 1968, this is not Pips country any more, and I must shamble off to Ottawa wringing my Polynesian paddies. Next time I'll go to the outer islands — not just Bora Bora, for there is an ex-OCR man there(.), but to Raiatea or Huahine. Or better yet, Lan-Chile Airlines flies to Santiago here via Rapa Nui, Easter Island. That ought to be safe from computers for a few years, unless Japanese tourists leave some hand-held jobs at the archeology sites.

It's still a lovely place, and away from the jet airport and the Papeete traffic and the Chevrolet salesmen and their wives, still green and ocean-girt and peaceful. Nuclear tests and hotel accountants and the population explosion threaten it, but as long as there are sailors and lovers and dreamers, Tahiti will live on.



Herb Gross

## Is There Unprofessionalism at the 'Highest Level?'

Manohar D. Apte of Oakland, Calif., sent me some computer output which he calls "the type of unprofessionalism that gives our industry a bad name." Especially, he said, when it is occurring "at the highest level" of our profession — the Institute for Certifying Computer Professionals (ICCP)! He then asks for my comments, and in view of my previously expressed support for the CDP examination and the institute, he certainly deserves to get them.

The printout (reproduced

alongside) is a failure notice sent out after the 1974 CDP examination by the ICCP Certification Council.

Apte, who passed four parts of the examination in 1973, faults the printout for being confusing and arrogant; raising more questions than it answers. He certainly seems to be right.

The first part says he has to take Systems Analysis and Design again — while he read the second part as showing that he achieved a "passing" grade in Systems Analysis and Design.

That's confusing enough for anybody! (In fact, the "60%-PASSING" designation refers to the range between 60% correct answers and the unspecified passing mark. It is not a definition of 60% as passing.)

Apte could have pointed out the incredibly arranged layouts with the date, name, address and

failed-section fields all having different starting points, instead of being lined up with each other.

He could have pointed out the anonymous signature — "The Certification Council" — while the letterhead gives five names, none of whom are identified as being any part of the council.

He could also have pointed out the lack of a space line between the heading and column titles, or between the column titles and the line items in the bottom of the form. In any case he would have been justified.

He didn't, but he probably knew I would see these anyway.

So I must agree with him that the printout is unprofessional. But I don't agree that the ICCP Certification Council is "the highest level" of our profession. It would be nice if it were and my hopes for the institute are based upon the assumption that sometime in the future it may earn that accolade. But today it has no genuine claim to such a position, although it does possess an impressive title.

The Certification Council is a group of people who were forced on the institute as a precondition to turning over the CDP examination to the group. New members of the committee are still selected secretly, as they were under the Data Processing Management Association (DPMA), by the council itself — not by the profession.

One apparent prerequisite for

membership is that a council member must have a willingness to carry on with a 10-year old method of handling a professional examination, leaving the validation of the examination to an inadequate statistical examination, instead of having it validated by Educational Testing Services or some really independent group. (True, some council members think of themselves as being radicals, but as one member, Dr. William Horne, said to me while he was still on the council, "If they don't like what I'm saying, I am always willing to resign, and I've told them

that.")

Even a revolutionary on the council won't disturb the powers-that-be if they have his agreement to resign when they wish!

With that sort of setup, I simply can't accept the ICCP Certification Council as having earned any really high professional level so far.

Sorry about that.

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### The Taylor Report

By

Alan Taylor, CDP



### CDP Validation Cost Low, Hidden

The validation of the CDP examination, a prime responsibility of the ICCP Certification Council is not given as a separate item in the institute projects, but is included with the work of initial computer grading and response analysis. However, as this totals \$4,400, \$2,200 for validation seems to be reasonable.

This compares with other figures\* such as:

\$15,150 — Administrative Salaries

\$13,192 — Clerical Salaries

\$11,900 — Printing

\$4,400 — Descriptive Analysis of Candidates

Can a Certification Council which year-in, year-out puts such a low emphasis upon examination validation be regarded as being at "the highest professional level."

\*Figures taken from projected costs on 1974 examination.

#### INSTITUTE FOR CERTIFICATION OF COMPUTER PROFESSIONALS

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We have the unpleasant duty to inform you that the ICCP Certification Council is unable to award to you the Certificate in Data Processing. The evaluation of your recent examination response indicates that you must retake the following sections:

SECT 5 SYSTEMS ANALYSIS AND DESIGN

The Institute for Certification of Computer Professionals deeply appreciates your interest in the CDP Program. The members of the Certification Council share the hope that you will sit for the next examination. An application and study guide will be sent to you as soon as they become available.

The Certification Council

PERCENTAGE OF CORRECT ANSWERS FOR EACH SECTION FAILED  
SECTION FAILED REASON FOR FAILURE 40-49% 50-59% 60-69% 70-79% 80-89% 90-99% 100%

This letter announcing the result of the 1974 CDP examination puzzled the recipient, Manohar D. Apte, as it seems to show he achieved a 60% passing mark — and yet failed in Systems Analysis.



## Problems of Program Design Perplexing

The following are some of the problems William Simmons would like to see discussed in a feature on program design.

- Is it possible to identify common logic structures that cover many problems? RPG seems to be based upon a generalized processing cycle. The balance line or low-key methods of collating sequential files is another example. Are there others?
- What are the practical considerations governing the PERFORM or CALL decision? How do other experienced programmers go about deciding when to make a part of a program a separately compiled module?
- Is it possible to use the CORRESPONDING option effectively? Can one cut down on detail coding without accepting an intolerable amount of qualification? What effect does this have on the size of each separately compiled module?
- What is the best way to organize the Working Storage in a program that utilizes several CALLED modules? Should the Working Storage be all in the mainline program or distributed to submodules? Can the Working Storage used by one submodule be reutilized by another submodule for economy of storage? How can this be coordinated with overlay structures?
- How can we best isolate our programs from dependency upon specific data structures? Is there a general file-handling technique?

## Professional Practices

# 'Program Structuring' Fills Gap Between Systems Design, Coding

By William B. Simmons  
Special to Computerworld

A lot of ground lies between systems design ideas and coding techniques. This area may not have a very good name, but it can be called "program design," "logic design," or "program structuring," and the fact remains it is a task that is still generally given to programmers.

And the fact also remains that most of us just don't have a good theoretical foundation in designing programs. Coding them is not much of a problem. Designing them is. What we need to know is not how to initialize tables, but when to use them.

The concept of structured programming can radically alter the programming trade. Or it can fail to live up to its promise (like so many other DP revolutions) because it was not properly understood.

Wouldn't it be a shame if this important new idea were discredited in the eyes of company managers by those who say: "Structured programming? Sure. That's what I've been doing all along. No trouble at all."

You don't believe it can happen? Well I've already seen it.

### Blunder in Design

I'm pretty good at coding programs but I'll confess that I still make the occasional blunder in designing them. Remember that there are thousands of programmers like me. We got into the programming trade the hard way and learned on the job. The companies we work for spend pennies on training and upgrading. And now we're faced with the prospect of revolutionizing the way we work.

I would like to see a regular feature in *Computerworld* dealing with design problems. I know it would be difficult at first to make the thing go, but it could grow into something quite powerful.

William B. Simmons is a programmer in Montreal, Quebec.

## Letters to the Editor

### DP Manager Finds Ways To Save on Paper Usage

As a manager of data processing in these times of material shortages, I have had to devise ways to save and still keep the department going as normal.

I feel that other managers are confronted with similar problems. However, I do not hear anyone talking about it.

Saving paper was my biggest concern and project. I have managed within two months to save about 20% of my normal paper usage.

I would like to pass along some of the ideas in hopes that they may help others and others will begin sharing ideas which they have devised:

- Cut back the number of copies which were being printed.

My findings were that people receiving the reports read them and then discarded them. We decided that managers could share reports.

- Condensed the printing by increasing the line counter per page, decreasing the spacing between print lines and increasing the lines per inch from six to eight.

- All programs which were compiled were single spaced.

- Insisted that more desk checking of programs be done, eliminating unnecessary compiles.

L.J. Peterson

Manager of Data Processing  
Wilshire Electronics/  
New England  
Cambridge, Mass.

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# PAN-WHAT?



## Standard Assembler? — Part I

# 'Unisym' Discounts Differences Among Minicomputers

By John J. Archer  
Special to Computerworld

Our entire approach to the problem of a standard Assembler for minicomputers centered around the idea of mapping a defined system onto a defined set of minicomputers (target machines). Before the "universal system" could be defined, the set of target machines had to be defined with respect to memory structure, register properties, interaction between registers and memory, address modes supported and instruction set properties.

The problem was simplified by not considering (in the initial stages) input/output and interrupt properties of target machines.

Once this information was collected and listed in a systematic way, it was used in defining the universal language and the virtual machine. The target machines used were:

Allied Business Systems Ltd. — GRI-99  
Arcturus Electronics Ltd. — A18-D

Computer Technology Ltd. — MOD-1  
Data General Corp. — Supernova  
Digico Ltd. — Micro-16V  
Digital Equipment Corp. — PDP 11/45

Synergy Software Ltd. has recently completed a feasibility study on behalf of the National Computing Centre Ltd. (NCC) to estimate what sort of cost, in terms of program storage and execution time overheads, would be necessary to attain transportability of Assembler-level software over a range of minicomputers [CW, March 20]. Synergy's approach, estimates and conclusions are detailed for *Computerworld* by John J. Archer, the company's chief design consultant.

General Automation, Inc. — SPC-16  
General Electric Co. Ltd. — GEC-2050  
Hewlett-Packard Co. — HP-2100A  
Honeywell — H-716

The system derived from the properties

of these machines is called the Unisym (UNified SYmbolic standard terminology) system. Briefly, the virtual machine consists of two accumulators (ACR<sub>1</sub>, ACR<sub>2</sub>), two index registers (XR<sub>1</sub>, XR<sub>2</sub>) and a nonpaged memory containing two autoindex registers (AXR<sub>1</sub> for incrementation, AXR<sub>2</sub> for decrementation).

All registers and memory locations are defined to be 16 bits long; the accumulators and index registers can perform arithmetic and logic operations and the index registers can also be used for indexed addressing modes. Data transfers are possible between any two registers and between any register and any memory location.

### Address Modes

The virtual machine supports direct and indirect (multilevel) address modes containing the submodes relative, indexed, relative indexed and double indexed addressing. In addition, the machine supports literal operand and autoindex addressing.

The Assembler language was derived by NCC and modified where necessary by Synergy. The language contains four basic groups of operations — move, arithmetic, logic and program control. In general, each instruction contains an operator and two operands (receiver and supplier).

A receiver can be a register or a memory location, and a supplier can be a register, memory location or literal operand. An operand in the form of a memory location can have any of the address modes mentioned above, instructions can be labeled and commented and comments could appear on separate lines. The general form of an instruction is:

### RECEIVER OPERATOR SUPPLIER

(possibly prefixed by a label and post-

fixed by a comment.)

The level of the operators is, in general, held to the same level of the operators of target machine Assembler instructions.

The language contains 26 operators and no condition-register processing capabilities. This means all conditional jumps employ data tests on actual registers or memory locations.

Because of the high mnemonic content of the language and its near-symmetry with respect to operands, it is very easy to learn and extremely flexible with respect to the types of operations that can be performed.

When a program is written in Unisym and compiled for a target machine, the resultant machine code should have relocatability and reentrancy. For maximum use and benefit, it was decided that true relocatability of machine code should be attained.

Reentrancy can only be achieved automatically by the production of machine code which is unmodifiable during program execution and stack processing functions.

The subject of stack-handling was not addressed during the course of the study, since this is a modular concept and could be added later. However, it was important to ensure that unmodifiable machine code be produced from source Unisym instructions.

The next part of this report will outline the mapping of the Unisym system onto the target machines.

## Source Library Aids B3500, B4700 Users

ST. PAUL, Minn. — Users of Burroughs medium-scale systems — the B2500, B3500 and B4700 — can have audit control over changes with the Program Library Control System from First Computer Corp.

This independent's system is said to simplify the operating procedures required for compilation and testing. It also provides "disaster-storage" for source programs through four-week retention of backup tapes, the company noted.

Listings of both source and object code can be produced as the control system works through the compilation process. There is also a flowchart generation option, the company noted, providing a graphic description of the program logic.

A directory of all source programs on the system and statistics on their activity is printed weekly as a control document.

The complete control system operates in 17K bytes of storage, plus disk space required for the library itself. The package costs \$4,500 installed and is available now from the Software Sales Division, First National Bank Bldg., 55165.

## 'Edos/30' Puts OS-Like Features At Disposal of Small 360 User

RICHMOND, Va. — Automatic volume sensing (AVS), resident transient support and a range of other OS-like capabilities are now available to the 64K 360/30 user with the release of Edos/30, a subset of the full Extended DOS from The Computer Software Co.

About the only Edos feature unavailable to the small 360/30 user is six-partition support — which is of little value in that small a machine anyway, the company noted.

Edos/30 is a complete operating system containing various enhancements beyond the limits of IBM's DOS. In addition to AVS, it provides a built-in spooling facility, an "intelligent" procedure library for JCL and extended source library support for application programs.

Fast dump/restore/copy routines, job accounting and text editing are also available and, where apparently similar to facilities in IBM's DOS, actually provide support more nearly like that of OS, the company said.

Though considerably more powerful than DOS, Edos/30 requires only 2K or 4K more core than a user's current DOS supervisor. The additional storage used is, in fact, located in high core, eliminating any need to re-link edit or recompile programs after installing Edos/30, a spokesman stressed.

In addition to the basic Edos/30, users may extend their systems even further with the disk space management (DSM) special feature. A carryover from full Edos, DSM provides dynamic file allocation,

release of unused file space once the actual space requirements are known, and the deletion of input files once closed.

Edos/30 can accept without change programs and files already in use under DOS.

The basic Edos/30 is available now for \$360/mo on a 30-day lease, or \$325/mo under an annual plan. The DSM feature costs an additional \$100/mo, or \$75/mo under the same arrangements.

The company is at 11 N. Sixth St., 23219.

## 'Autoflow II' Options Updated

PRINCETON, N.J. — IBM 360/370 users have more support than before in program development, testing and documentation with facilities recently added to Autoflow II by Applied Data Research, Inc. (ADR).

The Module Analysis Processor (MAP) for Cobol — which analyzes individual programs, providing cross-reference listings and program flowcharts — includes a Critical Variable Analysis feature. This identifies all variables tested to determine a program branch, the company explained.

MAP for assembly programs has been extended to include more cross-referencing capability, a compression feature — said to permit the program to be simplified for analysis and debugging — and an "English translation" that expands assembly coding into Cobol-like English.

Meanwhile, the Extended Text Composer (ETC), a word processor for creation and maintenance of texts and documentation, has been enhanced with an automatic index and an amendment facility.

Autoflow II's Cross Program Auditor (CPA) analyzes and reports on groups of programs designed to work together, to insure that data is structured and handled consistently. A data name glossary which lists all data names appearing in the set of programs has been added.

CPA has also been extended to analyze data defined in the Working Storage.

Autoflow II is available under permanent license for \$4,000 plus the cost of at least one of the three options: either MAP (\$2,750) CPA (\$3,300) or ETC (\$2,750).

ADR is at the Route 206 Center, 08540.

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## 'Global' Builds Assembler Source Code

NORTH SYDNEY, Australia — IBM 360/370 users gain the run-time efficiencies of Assembler and the coding-time efficiencies of a high-level language through the use of the Global programming system from DP Developments Pty. Ltd. (DPD) here.

Global output is source code for IBM's Assembler, and the system includes support for assembler instructions in line with Global statements, including all user and IBM-provided macro instructions. Utilizing the Assembler as the ultimate step, Global users can take quick advantage of IBM-provided support for new devices "since it usually shows up in the Assembler first," DPD said.

User-level programming is done on a pair of special coding sheets similar to those used in RPG.

## 'Debe' Remade for VM

NEW YORK — Standard Data Corp. has introduced CMS Debe, a file utility program to run under Conversational Monitor System for IBM's Virtual Machine Facility (VM/370).

An updated package based on IBM's Debe — "does everything but eat" — for OS and DOS, Standard's CMS Debe also includes many features of the Ditto utility that replaced the original Debe. Only those Ditto capabilities that are irrelevant to VM/370 operations are missing, Standard claimed.

CMS Debe provides the user with the ability to manipulate files and obtain listings or hex dumps of them.

Geared to the time-shared environment of CMS, the new Debe is invoked by typing 'DEBE' while in CMS command environment.

CMS Debe can be purchased for \$1,000 from 1540 Broadway, 10036.

## Magazine for Schools Asks Funds, Features

CONCORD, Mass. — Students and teachers in colleges and schools may be able to share computer-based games, simulations, problems, exercises, curriculum materials and ideas through the columns of a magazine planned for initial release this fall.

*Creative Computing* deals with computers and related devices in various academic areas and in DP career education, according to David Ahl, the publisher. Computers can make learning fun, he said adding, however that the new magazine, to be published bimonthly, will not be as whimsical as the Peoples Computer Co. tabloid, nor as serious as various other periodicals already available.

Ahl expects to run *Creative Computing* as a nonprofit project, with support — financial and editorial — from any interested people, companies, schools or foundations. Charter subscriptions (\$6/yr) are being accepted and sponsorships for more substantial contributions are encouraged, Ahl said.

Various articles have already been contributed, but "anyone with any ideas could really help the teacher work with computers" should feel free to contact *Creative Computing*.

The magazine offices can be reached through P.O. Box 1036, 01742.

The system's use of a limited number of reserved words means, however, that it can be learned easily by programmers who are used to Cobol, PL/I or Assembler itself, as well as RPG.

Trainees take to the Global programming "easily," the company said.

Running through the Global edit and generation steps before the Assembler adds between 10% and 25% to the assembly time on a 360/30 with 2314 disks operating under DOS, DPD admitted, but programmer coding and testing time is cut in half with the new system, a spokesman claimed.

### Available Now

Global for DOS users, in either "real" or VS environments, is available now with an upward-compatible OS version under development. Global is currently available only in Australia, but DPD has had "approaches from two large international companies to obtain Global marketing rights," the spokesman said, adding "we expect to conclude these arrangements shortly."

In Australia, Global can be purchased for about \$36,000 or rented for approximately \$1,100/mo. DPD is at 221 Miller St., North Sydney, New South Wales, 2060.

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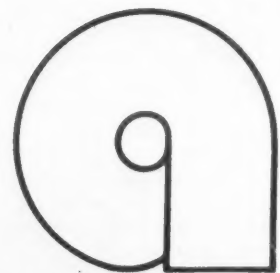


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## School Days

The following is a sampling of public seminars and workshops scheduled during the next month and a half. When two prices are shown, the first is for members of the sponsoring organization; the second, for non-members.

July 13-14 — **Workshop on Interactive Computer Graphics**; Boulder, Colo.; \$45/\$50; ACM/Siggraph, c/o James Foley, Department of Computer Science, University of North Carolina, Chapel Hill, N.C. 27514.

July 15-17 — **Conference on Computer Graphics and Interactive Techniques**; Boulder, Colo.; \$50/\$60; ACM/Siggraph and University of Colorado, Bureau of Conferences, 970 Aurora Ave., Boulder, Colo. 80302.

July 15-19 — **Regional Conference on Measurement and Evaluation of Computer Systems**; Williamsburg, Va.; funded by National Science Foundation; Dr. S.W. Katzke, College of William and Mary, Department of Mathematics, Williamsburg, Va. 23185.

July 22-24 — **How to Develop DP Standards**; Washington, D.C.; \$375; Brandon Applied Systems, Inc., 1611 N. Kent St., Arlington, Va. 22209.

July 22-24 — **Designing Computer-Based Payroll Systems**; Atlanta\*; \$380/\$440; American Management Association (AMA); 135 W. 50th St., New York, N.Y. 10020.

July 22-24 — **EDP Planning**; San Francisco\*; \$395; Institute for Advanced Technology (IAT), 6003 Executive Blvd., Rockville, Md. 20852.

July 22-24 — **Effective Management of DP Projects**; New York\*; \$395; IAT.

July 22-24 — **Advanced Data Base Design and Implementation**; New York\*; \$395; IAT.

July 22-26 — **Senior Systems and Procedures**; Toronto\*; \$495/\$570; AMA.

July 24-26 — **Program Performance Measurement and Optimization**; New York\*; \$395; IAT.

Aug. 5-7 — **Computer Auditing and Control**; San Francisco\*;

\$395; IAT.

Aug. 5-6 — **Data Base Concepts**; Chicago\*; \$295; IAT.

Aug. 7-9 — **Data Base Structures and File Organization**; Chicago\*; \$395; IAT.

Aug. 7-9 — **Business Applications of Minicomputers**; New York\*; \$395; IAT.

Aug. 12-13 — **The Role of the Data Administrator**; Washington, D.C.\*; \$295; IAT.

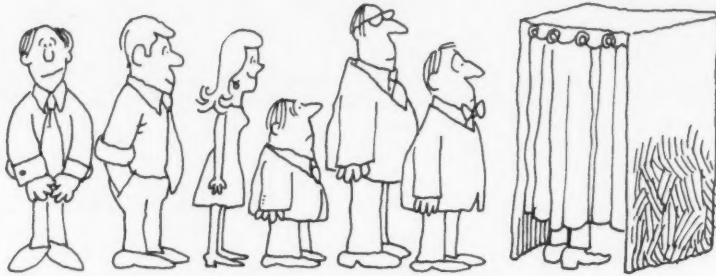
Aug. 19-23 — **Structured Programming and Design**; Estes Park, Colo.; \$200 to \$700 depending on days enrolled; Brandon Applied Systems, Inc., 1611 N. Kent St., Arlington, Va. 22209.

Aug. 19-21 — **Data Base System and Concepts; Implementation Planning**; NYC\*; \$425/\$485; AMA.

Aug. 27-29 — **Engineering Measurements of Man-Machine Performance**; Washington, D.C.; \$315; George Washington University, Continuing Education Program, Washington, D.C. 20006.

\*Also scheduled for other cities later.

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We selected this seminar for possible inclusion in the EDP Seminar Series after watching it in action. It was developed by Performance Development Corporation under the direction of its President, Leo J. Cohen, a nationally known consultant in data base systems. Mr. Cohen will continue as seminar director, and the seminar leaders are PDC staff who are experts in their own right. They include Alan Stutz and Steve Robinson, both of whom are well-known for their work in this area. All instructional staff have been involved in design and implementation of a variety of data base systems for major U. S. companies.

### Who should attend.

If you're going to be involved in the design and implementation of a data base system — whether as the DP Manager, Data Base Administrator, planner, analyst or programmer — then you should be at this seminar. It will help your department, your company and you!

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Whether or not we hold this seminar will depend on your response now. If interest is sufficient, we plan to hold these seminars in several cities this fall. When the decision is made, we'll send you an advance brochure and registration form, giving you first chance to enroll. So, if you're interested send in the coupon now. There's absolutely no obligation.

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## Turnkey Trial

### User Tests CRT/Software On-Line System

By Patrick Ward  
Of the CW Staff

SAN MATEO, Calif. — The first user testing a combined CRT and TP monitor on-line systems package is finding the transition from his all-batch environment a smooth one so far.

California Casualty Management, Inc. has entered a free two-week testing period of an on-line package jointly offered by Wyle Computer Products, a terminal maker, and GBA International, which markets the Swift TP Monitor.

The two firms will install Wyle CRTs and Swift in any interested DOS user's shop in the Los Angeles and San Francisco areas, if the user is considering adding on-line capability.

In cases where a 360 user does not have enough core to allow adding on-line capability, a third firm, Information Control Corp. of El Segundo, will provide the necessary add-on core on a free trial basis.

The Swift TP monitor is "very easy to use; you don't have to retrain all of your programming staff," commented Ron Smith, computer operations manager at California Casualty.

Smith said he plans to bring up a usable accounts receivable inquiry application during the trial period to show his users what he can do for them by adding on-line capability.

Installation of the Wyle hardware and the GBA software took about two hours at his site, Smith said. One of the local terminals is in the computer room for programming debugging; the other is in a conference room for demonstrations.

Though GBA representatives have offered to write applications programs for California Casualty, the company's own staff elected to write the test application program to learn how it was to work with the on-line system.

"This is not only a test for users but a test for us," Smith noted.

"It does seem to be going along very smoothly, and with very little effort we seem to be able to tap into our accounts receivable file for inquiry purposes. I'm impressed from that standpoint," added Ralph Wells, director of information services for the firm.

California Casualty's DP shop operates a 256K IBM 360/40 under DOS with eight spindles of Memorex 2314-type drives.

California Casualty is running batch work in two partitions, and had been using Software Design, Inc.'s Grasp spooler in a third.

Software Design provided a version of Grasp which established its own fourth partition, freeing a partition for the Swift TP monitor.

#### 2260 Capabilities

Wyle's CRT Model 8000 is an IBM 2260-compatible device that has a

1,920-character screen, the same bit/sec rates as an IBM 3270 and everything else that is optional on a 2260, a Wyle spokesman said.

Swift occupies between 30K and 50K of real core, according to a GBA spokesman. Yet Swift "has all the facilities of CICS," plus facilities CICS doesn't have. Most notable of these is programming ease, he said.

#### All the I/O

"The reason is that... Swift does all the I/O for you, not only to the tubes, but to your files." So in a Cobol program, "you have working storage and procedure division, that's it. There's no consideration of files whatever." The Swift system, as installed, handles it for the user, the spokesman added.

Programmers writing new applications for CICS tend to come in after hours when the monitor is down, the spokesman commented, but Swift allows the

programmer to put in a Cobol deck and work with a debug aid on one CRT without disturbing production use on the other CRTs.

Swift supports Isam, Direct, Total, Bomp, Dbomp and Segam, the spokesman said.

In the two-week trial runs, GBA expects to provide such applications as simple inquiry, on-line update and data collection applications for users.

#### Two Year Lease

A typical configuration of eight Wyle 8000 CRTs leases at \$900/mo on a two-year lease.

The Swift package leases at \$500/mo on a 30-day cancellable lease, or \$400/mo on a two-year lease. Maintenance for Swift and the user's DOS system is included.

Wyle Computer Products is at 13130 Yukon Ave., Hawthorne, Calif. 90250. GBA International is at 2670 Leavenworth St., San Francisco, 94130.

## IDCMA Objects to AT&T's DDS; Says Non-Bell Units Eliminated

By Ronald A. Frank  
Of the CW Staff

WASHINGTON, D.C. — AT&T's proposal for the Dataphone Digital Service (DDS) results in "an effective economic ban on substantially all interconnection of customer-provided equipment," an industry group has told the FCC.

Commenting on the DDS application, which is scheduled to take effect on July 18, the Independent Data Communications Manufacturers Association (IDCMA) said the service effectively prohibits data users from direct connection to private-line facilities. This "has always been permitted in cases of interconnection of customer-provided equipment to private lines under Tariff 260," IDCMA said.

The prohibition is caused by the requirement that users connect to DDS either through an AT&T-provided Channel Service Unit (CSU) or, at the user's option, an AT&T-provided Data Service Unit (DSU), the FCC was told. The DSU would allow the user to provide signal conversion, timing recovery and logic circuitry.

#### Analog Restrictions

Also of concern to users is the requirement that Off-Net Adapters (ONA) or extension arrangements of DDS to analog facilities would restrict customers to Bell data sets. This is because the ONA would be located in an AT&T office and would consist of at least a data set, buffer and

DSU, the IDCMA comments continued.

The restrictive "no-mix" provisions against the use of noncarrier equipment is "an absolute bar on the use of customer-owned or provided data sets." And even if the no-mix provision were removed, customer-provided equipment would still have to be "technically compatible with Western Electric units," IDCMA said. The net effect is that equipment operated by customers today will not be useful "anywhere for DDS analog extensions," and this in turn discriminates against customers who own their own modems.

#### Lower Failure Rates

Supporting the DDS application, Packet Communications, Inc. (PCI), which is planning a packet-switched communications network, said the "simplified interface units on AT&T customer premises... promise far lower failure rates and shorter repair times" compared with more complex analog modems. PCI said it approved of AT&T's provision to allow for leasing DDS facilities to Composite Data Service Vendors, which is Bell's terminology for packet-switched net carriers.

Also objecting to the DDS plan were MCI and Datran. Among those endorsing the service were the National Retail Merchants Association, McGraw-Hill and American Satellite Corp.

The DDS proposal will go into service unless suspended by the FCC before the effective date, an FCC staff spokesman said.

## IBM Modem Handles 4,800 Bit/Sec Data

WHITE PLAINS, N.Y. — IBM has expanded its line of modems with the addition of a 4,800 bit/sec unit.

Designated the 3874, the modem can operate with the 2701, 2703 line controllers and with the 3704 and 3705 front ends. It is also compatible with the 3735, 3780 terminals, the System/3 and System/7.

On dial-up lines, the 3874 can be equipped with auto call and auto answer features. On private lines the modem can be configured for either multipoint or point-to-point circuits including "multipoint control" for a central site modem or "tributary control" for a remote site. In multipoint nets six remote modems can be connected to a central site.

The 3874 can be "shared" by as many as three terminals at one location although only one terminal can be handled at a time and all switching between terminals is done manually.

The modem has a half-speed capability for communication over temporarily deteriorated lines. A feature allows the 3874 to be switched from a dedicated line to a dial network in the event of line failures. The device automatically makes initial signal equalization adjustments and has diagnostic capabilities that help identify modem, line or terminal failures.

The new modem is available under the IBM extended term plan, which provides for a two-year contract period, at prices ranging from \$155- to \$265/mo, depending upon features selected. Users with shorter term needs may use the IBM rental agreement with monthly charges ranging from \$183 to \$282. Purchase prices range from \$4,650 to \$7,200.

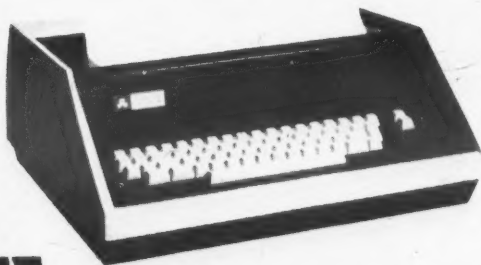
Customer shipments will begin in the first quarter of 1975.

## AT&T Shifts on D1

NEW YORK — Users who want to add D1 conditioning to their 9,600 bit/sec private lines will pay the same charges regardless of whether they use Bell data sets.

An earlier statement, according to AT&T, was incorrect as it applied to the use of D1 with noncarrier data sets. "There is no difference in the way charges are applied to a Bell System data set or a competitor-supplied modem."

The spokesman also said Bell had always intended to make D1 conditioning available for both the AT&T 209 data set and non-Bell 9,600 bit/sec modems. In all cases where D1 conditioning is installed, the customer will have to pay a one-time installation charge plus a one-time charge for service terminals, the spokesman said.



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## MCI, SP Lower Rates to Compete With New AT&T High/Low Tariff

WASHINGTON, D.C. — Two specialized carriers have revised their rates downward in the wake of AT&T's new high/low density private-line tariff which took effect on June 13.

Both MCI and Southern Pacific Communications Co. lowered rates to be competitive with the lower rates now in effect along the major high-density routes of AT&T.

MCI told its users the new AT&T rates were in effect pending a decision by the FCC expected "in three to four months." As an example of the lower charges, MCI said a New York to Philadelphia voice-grade channel will now cost \$172.05, down from \$206.85. This compares with a high-density AT&T charge of \$190.55, down from \$226.80 under earlier private-line rates.

Southern Pacific eliminated its separate charge for network signaling of \$11 per end, and lowered its cost to a flat 69 cents per channel mile/mo. Previously it had charged 95 cents for the first 500 miles and 53 cent/mile beyond.

The rates for local loops were "nationwide averaged" and changed to a two-tier structure. One level of \$32/mo applies to any intraexchange line and \$50/mo plus \$2.10/mile for interexchange facilities. The lower rates bring Southern Pacific down to an estimated 16% below AT&T high-density charges, a spokesman said.

The SP rates went into effect June 18 and affected about 79 channels now being billed, while the MCI rates took effect on June 19.

## Bell Presents Seminar Series

NEW YORK — As part of a continuing program to inform users of its available services, the Bell System presents a series of seminars for specific industries and topics.

The seminars include presentations for users in retailing, banking, education, state and local governments and hotel/motel managers. In addition, special seminars are held for executives and users who want to know more about Bell communications offerings.

Each all-day session includes presentations by Bell marketing and technical personnel and describes services

designed for the attendees' specific area of interest.

A typical schedule of seminars scheduled for August includes: a general session for executives, Aug. 5 and Aug. 22; bankings, Aug. 6; data communications, Aug. 27; retailing, Aug. 14; education, Aug. 21; state and local government, Aug. 26; and hotel/motel, Aug. 28.

The seminars are offered at no cost to users and arrangements should be made through local Bell operating companies. The sessions are held at the Bell seminar room at 866 Third Ave.

## With Detachable Keyboards

## Singer Adds Remote CRT Terminals to System Ten

NEW YORK — The Singer Co. has added two video display terminals (Models 81 and 82) to the distributive data processing capabilities of its System Ten.

The Model 81 is a display unit that can communicate synchronously or asynchronously with the System Ten from remote locations. The Model 82 is a display input/output console designed for two-way local conversation with the system.

Designed to interface with either a 30- or 165 char./sec printer, the Model 81 terminal can provide low-cost or specialized hard-copy printing at remote locations or at the computer site, Singer said. When it is desirable to have more than one display at the same location, a daisy chain option permits several units, separated by up to 50 feet, to share one modem.

The Model 81 may operate with either internal or external modems. Asynchronous communications is at speeds of 150-, 600-, 1200- and 1,800 bit/sec in Ascii code with even parity. As an option, synchronous communications is available

at speeds up to 2,400 bit/sec.

The Model 82 may be used for input/output inquiry functions such as interrogation of open order files and credit updating of merchandise control files, etc.

Both the Model 81 and 82 have detachable keyboards — the standard display size is 960 characters with a memory expansion to double the display to 1,920 characters — optional keyboard arrangements, protected fields and cursor/edit controls.

With delivery in 30 days, the Model 81 video display terminal is priced at \$4,000 or is available at one- (\$125), three- (\$115) or five-year (\$105) monthly lease rates which include service.

The Model 82 is priced at \$5,000 and also is leased monthly including service for one year (\$135), three years (\$132) and five years (\$130).

## Plot-10 Gets 4010 CRT Support

BEAVERTON, Ore. — Tektronix, Inc. has an improved version of its Plot-10 terminal control system for time-sharing systems.

Release 3.0 is available as a software package which supports the Tektronix 4010 family of display terminals.

In addition to the line drawing, scaling and alphanumeric capabilities previously offered, support has been added for the new 4014 and 4015 display terminals and for the optional enhanced graphics module. This support includes provisions

for 4,096-point addressability, hardware dashed lines and hardware point plot.

Logarithmic, semilogarithmic and polar transformations have been added, and a new buffered input/output scheme has been devised which the user can adapt to his own system, Tektronix said.

Release 3.0 can be ordered on a paper source tape or on a source card deck for \$325, which includes the user's manual. User's manuals can be ordered separately for \$5 each. Delivery is two weeks.

The firm's address is Box 500, 97005.

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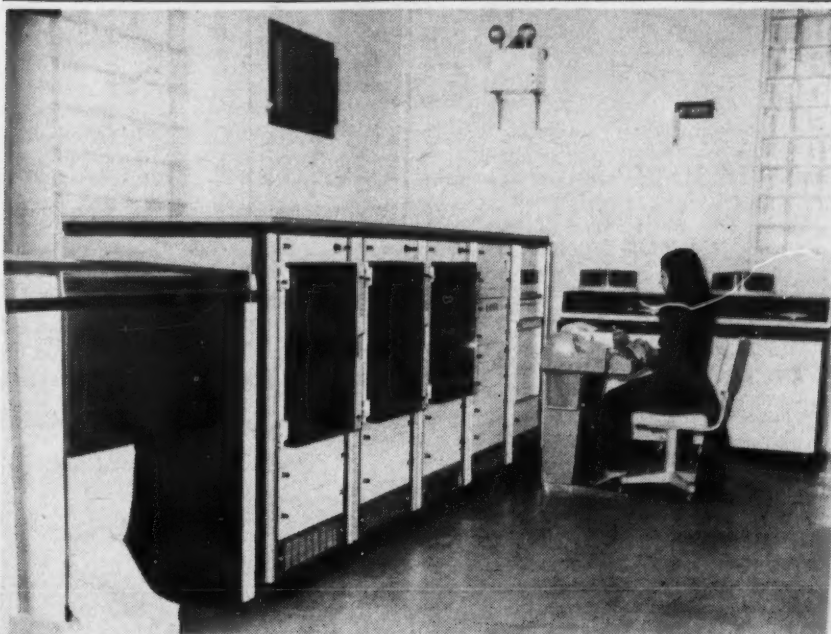
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# SYSTEMS & PERIPHERALS



Early computer configuration tested at Shell-VN included line printer, three tape drives, two 2314-type disk drives and 48K of core.

## Computer Hardware Provides Printer and Core for 1800 CPU

SACRAMENTO, Calif. — The IBM 1800 CPU is getting a lot of attention from Computer Hardware, Inc. (CHI). This firm introduced a 600 line/min line printer, the CHI 1103, and an add-on core memory system, the CHI-1106C. Both systems are low-cost replacements, the firm said.

The printer utilizes IBM 1443 printer attachments and operates on single or multiple-part continuous forms up to 19.5 in. wide. Vertical forms control is provided with a 12-channel paper tape reader. The printer is priced at \$22,500 and leases are available.

The core memory can be added on to both the 2- and 4  $\mu$ sec models.

Up to 65K words are available in increments of 8K words with an optional 8K backup. CHI core attaches to the 1800 through slip-on connectors attached to the pin side of the IBM logic gates. Connections are not permanent and can be easily installed or removed, according to the firm.

The core system is priced at \$9,900 for 8K to \$73,500 for 65K with an 8K backup. Leases are available.

CHI is at 2424 Arden Way, 95825.

## DEC Offers 3 School Packages

MAYNARD, Mass. — Three minicomputer systems developed expressly for use in secondary schools and colleges have been introduced by Digital Equipment Corp. (DEC).

Designated the Edusystem 100, 200 and 250, the new systems incorporate PDP-11 minicomputers. The systems are designed for expansion so that as needs increase at schools and colleges the systems can be upgraded, DEC said.

Peripherals and computer system options can be added in the field to upgrade the Edusystem 100 to a 200 or 250.

Typical uses of the systems are for student instruction in computer programming fundamentals, other computer science activities, as an aid to students in other areas of study such as mathematics and physics and also for administrative recordkeeping by the faculty.

Edusystem 100 permits up to eight simultaneous users to program in Basic. All of the software required to operate the system resides in core memory.

The Edusystem 100 operates with a variety of terminals, from standard teleprinters to higher-speed Decwriters and CRT terminals. Prices range from \$11,000 to \$32,000.

Edusystem 200 also permits up to eight users to program simultaneously in Basic, but in addition, peripheral storage devices standard with the system permit program flexibility by storing accessible files of data or program subroutines.

Prices for a typical Edusystem 200 will range from \$23,000 to \$50,000.

Edusystem 250 adds the ability to perform foreground/background processing.

Edusystem 250 prices range from \$32,000 to \$54,000.

## Uses Cobol Compiler

## Two 704 Minis Form Base For Business DP System

By Vic Farmer  
Of the CW Staff

SAIGON, Vietnam — One of the largest minicomputer installations dedicated to business data processing activities is here at Cong-Ty, Shell Vietnam's (Shell-VN) main office building.

The DP center is based on two Raytheon 704 minicomputers using a limited Cobol compiler. The systems and the compiler were designed by the Honolulu-based The Systems Corp. (TSC) and, according to Hans Haerry, finance director for Shell-VN, will result in at least a 30% cost saving compared with traditional business DP systems.

Applications transferred from an IBM 360/40 previously used at a Saigon service bureau include general ledger, accounts receivable and payable, payroll, sales analysis, cost analysis, transport and distribution analysis, capital expenditure control, value-added tax and other tax declarations.

In addition to the two Raytheon 704 minicomputers with a total of 48K of memory, two ISS 2314-type disk drives, six Infoton Vista CRT terminals, four Pertec 800 bit/in. tape drives and a Data Products 132-character wide 600 line/min printer provide the system storage and I/O. TSC itself designed a multiplexer channel for the larger of the two systems.

The systems themselves are not connected — the smaller 704 is used in a typical key-to-disk data entry system, while the larger unit serves as the batch processor with some concurrent interactive processing.

### RPG and Cobol Compilers

Software supplied by TSC included a time-sharing file management system and RPG and Cobol compilers. These compilers simplified the program conversion process because some of the firm's programs were created for a 360/20 in addition to the 360/40.

The Cobol compiler was written by TSC's director of system development, Jin Won Park.

His compiler is standard Ansi Cobol minus Call, Sort, Report Writer, Compute and Examine functions. These functions are taken care of by intermixing Assembly language routines into the object decks.

Shell-VN has already placed an order for additional hardware including two more 2314-type disk drives, six CRT terminals, four hard-copy terminals and communications devices to absorb additional work.

Some of the new terminals will be located outside Saigon and will be tied to the computer through radio and wire communications links.

The original system cost slightly over \$200,000 and the add-on will tack another \$80,000 to the system price.

### Card-Based Equipment

Before the mini system, Shell-VN used various combinations of in-house card-based equipment and outside time on a 360/20 and 360/40.

The EAM equipment processed data full time using eight keypunch machines.

Additionally, over 40 hours per month were used to run Shell-VN's applications on a 360/20 owned by a local business firm in Saigon. Approximately three hours per month were being used on the local service bureau's 360/40.

An integrated system did not exist, and management was almost reaching the point where it would be unable to adequately control operations.

Shell-VN then decided to convert everything to the service bureau's 360/40, but applications designed to run on the EAM equipment converted for the 360/40 used too much expensive time.

Shell instituted a project to define DP requirements and subsequently to evaluate available hardware.

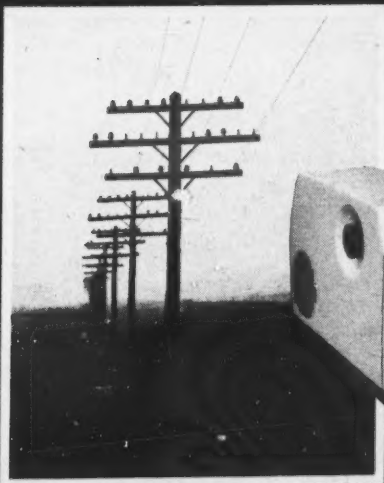
The results of the requirements analysis and hardware evaluations indicated a minicomputer system would provide maximum cost-effective results while still allowing the desired flexibility of conducting batch and on-line processing concurrently.

The key-to-disk approach to data entry also eliminated punched cards, which have proven unusually troublesome in the tropical climate because of high humidity, termites and storage problems. TSC trained the local maintenance engineers.

Initial reaction of the 25-man DP staff to the cardless configuration has been highly enthusiastic, according to Donald J. Kemp, systems and data processing manager at Shell-VN.

Not only are the programmers working more effectively than anticipated, but the keypunch operators quickly adapted to the terminals. The data entry operators were delighted with the terminals' speed, lack of noise and the ease of corrections compared with the previous card equipment, he said.

The system was accepted by Shell-VN after acceptance tests within one year after the firm instituted its internal study to consider various DP alternatives. Shell-VN, with 1,000 employees, is the largest private company in the Republic of Vietnam and supplies over half the oil market. The firm's activity consists entirely of marketing and distribution, with no refining or exploration work.



## talk is cheap

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# Introducing the I

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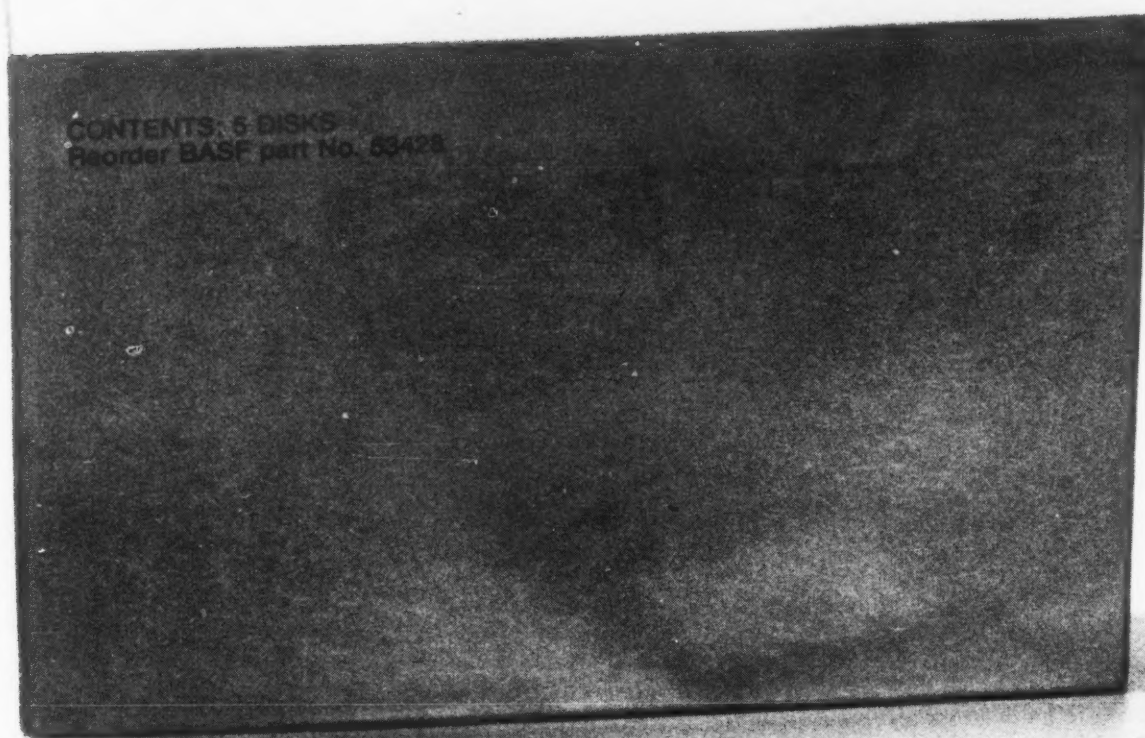
Every Flexydisk 1 is 100% certified so you won't have mistakes to cope with. Each disk is also pre-formatted for immediate use. Flexydisk 1

have a clean, debris-free surface like purpose coating gives increased disk life. Head wear shown head wear to be less than 23% after 100,000 loaded operation!

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**Flexydisk 1 are Self-Cleaning.**

We pack our Flexydisk 1 in a special



Index hole.

Ultra-smooth coating... our special formulation plus unique finishing method gives Flexydisk 1 longer life. 100% certified to be error-free.

Jacket and liner... supports and cleans disk surface, cutting down on errors.



**You're already paying for BASF quality.**



# BASF Flexydisk I

like our computer tape. A special dual-disk and head life. Our tests have 23.5 micro-inches in 92 hours of head

ou short if 3740 equipment is updated, them on *both* sides. Just to be sure.

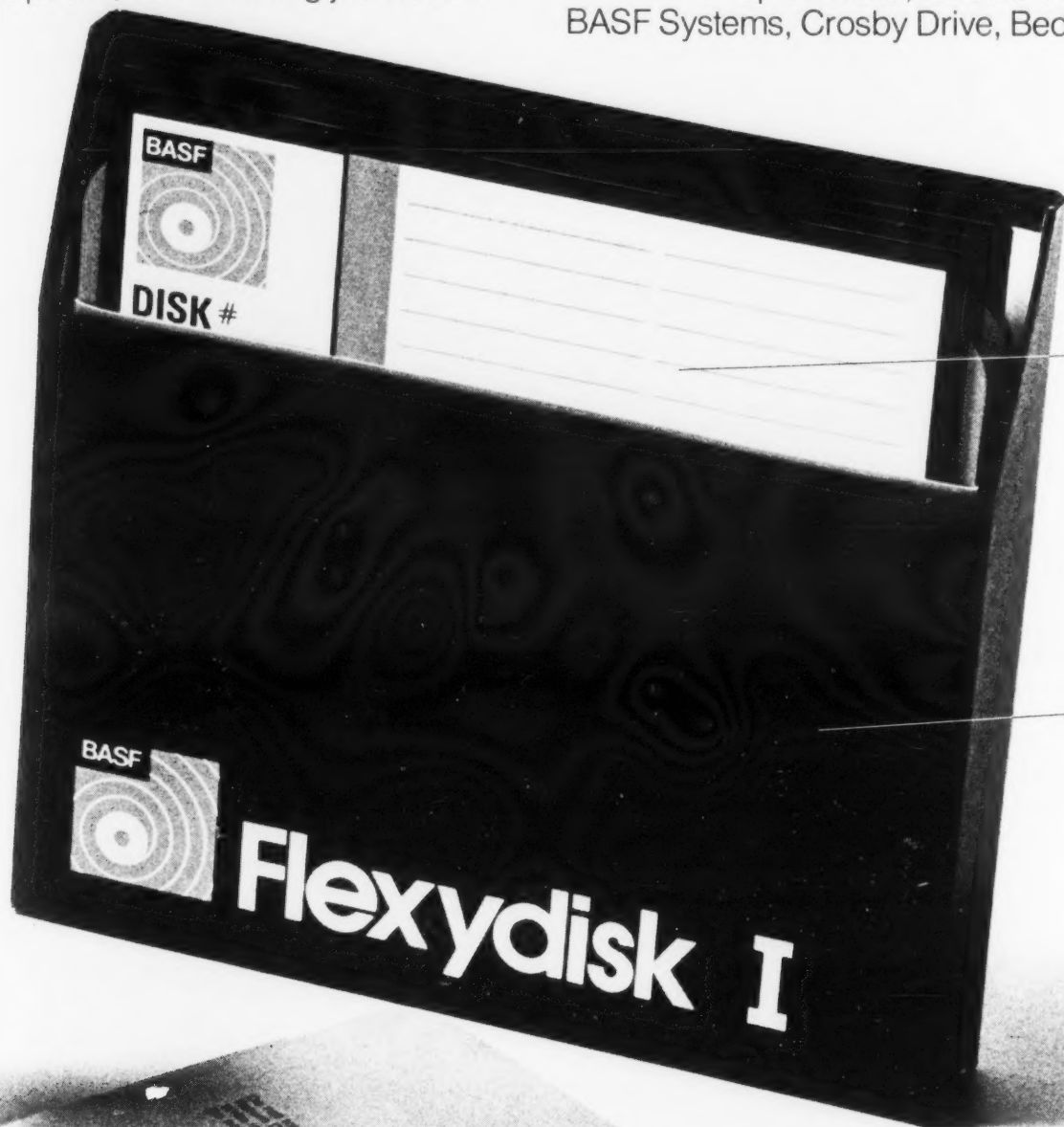
n a special, self-cleaning jacket and

liner. This unique method of packaging cuts down on friction and the possibility of errors.

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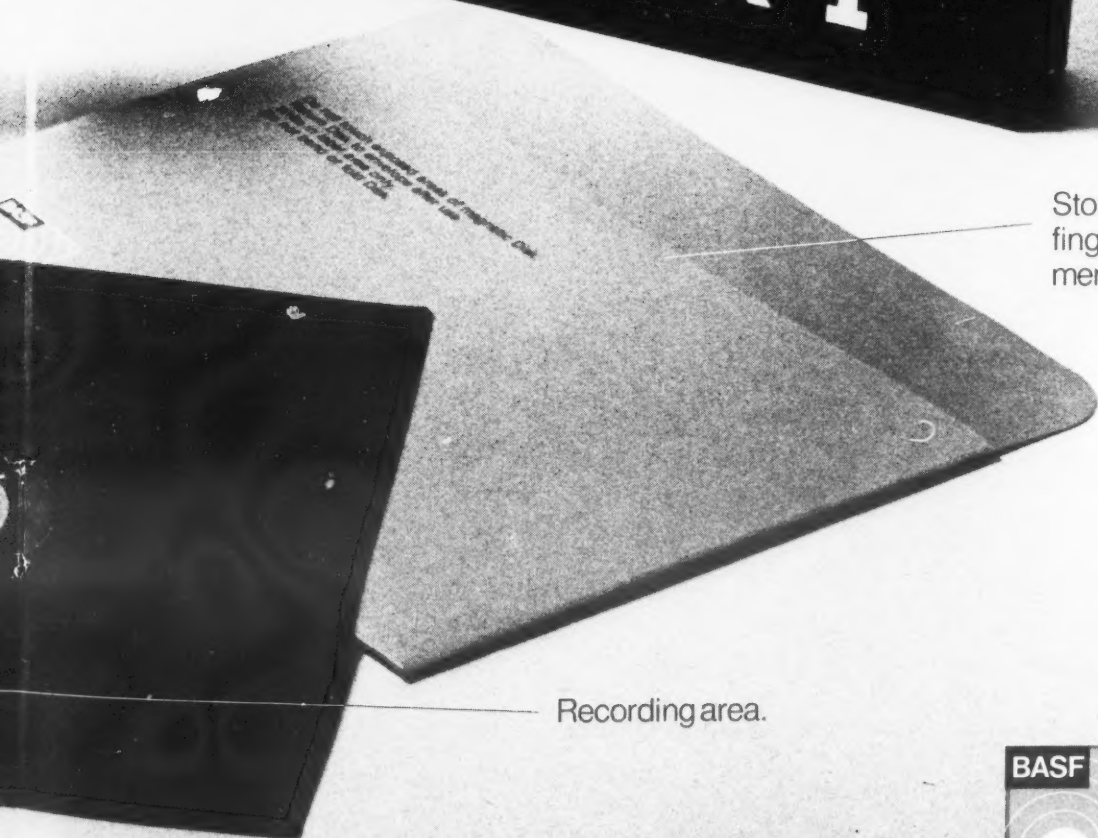
A good product deserves a good package. Flexydisk I come in compact, tabulated library 5-packs. They save on storage and record-keeping, and make neat desk-top files. They're a great time-saver. A supply of color coded labels is also included for easy job identification.

Drop us a line, and we'll send you complete details on Flexydisk I. BASF Systems, Crosby Drive, Bedford, MA 01730.



Color-coded I.D. labels are included for easy cataloging of disks.

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Recording area.

quality, you might as well have it.





## Cipher Drives Use 80 W

SAN DIEGO, Calif. — Cipher Data's Model 85X and 70X tape drives require approximately 50% less power (80 W) than the firm's previous models.

Low inertia, high torque, direct drive motors operate at speeds of 12.5-, 18.75-, 25- and 37.5 in./sec.

Using an 8-1/2- or 7-in. reel, the units feature straight-through loading, and an auto-

## 3M Cartridge Unit Handles 8 Drives

PLAINVIEW, N.Y. — The Series 2400 3M cartridge tape drive system from Qantex uses simplified software requiring only two registers for complete tape drive control and data handling.

It performs all 1/2-in. tape commands. Modular in nature, the system can handle up to eight tape drives, thus incrementing storage in 2.5M-bit steps.

The system is offered in three basic configurations: with no interface, as a tape formatter and complete with minicomputer interface.

Prices start at less than \$3,000 for a tape formatter and drive.

An interface for a Digital Equipment Corp. (DEC) PDP-11 costs \$650 from the firm at 200 Terminal Drive, 11803.

### Decision Offers S/3 Users Five-Year Lease Plan

HORSHAM, Pa. — Decision Data Computer Corp. has announced a five-year leasing plan for its line of 96-column card equipment for IBM System/3 users. The firm is at 100 Witmer Road, 19044.

### Firm Mates Minis, Peripheral

BEDFORD, Mass. — Information Design, Inc. has expanded its regional minicomputer and peripheral interface service to national coverage. The company will do individual peripheral interfacing or accept responsibility for producing a turnkey system. The firm is at Civil Air Terminal, 01730.

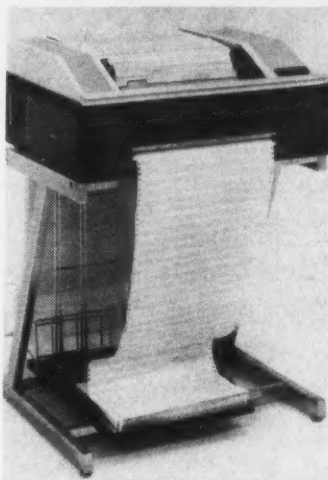
matic buffer arm retraction eliminates the problem of arm snap-back during loading.

The units are available in 7-track with a choice of two densities from 200-, 556- or 800 bit/in. or in 9-track in either 800 bit/in. NRZI or 1,600 bit/in. IBM phase-encoded formats.

Prices start at \$2,700 for the Model 85X60 and \$2,450 for the Model 70X60, which are available with continuous write/continuous read and read-after-write features.

Interfaces for most minis are available and range from \$875 to \$1,575 additionally.

The firm is at 7655 Convoy Court, 92111.



Tally printer interfaces to Data General Nova minis.

## Tally 2000 Linked to Nova

KENT, Wash. — Tally Corp. has introduced a family of printer interfaces and controllers that make the Tally 2000 Series 200 line/min printer compatible with the Data General Nova family and the Digital Equipment Corp. (DEC) PDP-11 minicomputers.

### RS 232 Interface

Communications interfaces include an RS 232 "teletypewriter format" serial version for 600- to 1,200 bit/sec operation as an on-line communications printer.

An alternate configuration allows 600- to 9,600 bit/sec serial

operation for minicomputer output.

In addition to the standard Tally parallel interface, other interfaces are available to emulate various makes of printers such as Centronics, Data Printer and Data Products for easy systems integration, Tally noted.

A 200 line/min printer interfaced to a Data General Nova costs \$5,700; one 125 line/min printer, \$5,200. Equivalent prices for a DEC PDP-11 printer are \$5,500 and \$5,200 respectively.

The firm is at 8301 S. 180th St., 98031.

The new GTE Information Systems' IS/7800 Series Intelligent Video Terminals cost an average of 15-39% less than IBM 3270's on one-year rental, and 33-43% less on three- and five-year rentals. Buy them outright, and save 40-50%.

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GTE Information Systems: One Stamford Forum, Stamford, Conn. 06904. Atlanta, 404-688-1670; Boston, 617-237-5222; Chicago, 312-332-7800; Cleveland, 216-771-8455; Dallas, 214-741-4361; Detroit, 313-353-5494; Hartford, 203-563-3767; Houston, 713-626-1713; Los Angeles, 213-380-2309; Minneapolis, 612-854-2898; New York, 212-486-3290; Philadelphia, 215-649-7410; Pittsburgh, 412-391-4170; St. Louis, 314-863-0330; San Francisco, 415-349-2600; Seattle, 206-283-3103; Washington, 202-293-2800; Montreal, 514-866-9324.



## Modcomp I/O Can Be One Mile Away

FORT LAUDERDALE, Fla. — The Remote Acquisition Subsystem (Remac) option allows Modcomp mini-computer users to interface I/O hardware at distances up to one mile.

Remac consists of a link controller and a link terminal. The link controller interfaces to the Modcomp I/O Bus through the peripheral controller interface. Device address selection is implemented by switches mounted in IC sockets.

This feature enables the link to respond to more than one

set of device addresses. Two device addresses are assigned to the link; the even addresses correspond to digital and analog outputs and the odd addresses are for digital and analog inputs.

Up to three additional link terminals may be connected to one link controller in a daisy chain fashion. Each link terminal is capable of handling up to four Modcomp process I/O interfaces.

Data transfers between the CPU and the link controller may take place under either test and transfer mode, inter-

rupt mode or DMP mode.

The serial link is capable of transmitting and receiving data simultaneously at word rates of 17,400 word/sec at distances up to one-half mile and 8,700 word/sec at distances up to one mile.

The cost of the basic Remac subsystem consisting of the link controller and link terminal is \$3,000. The price for each additional expansion terminal is \$1,800. The Remac subsystem will be delivered in 60 days from the firm at 1650 W. McNab Road, 33309.

## Identimat Central Station Polls 16 Security Terminals

NORTHVALE, N.J. — For security conscious users, Identimat Corp. has brought out a central station (CS-1) for use with its Identimat terminals.

The Identimat verifies the identity of individuals by measuring and comparing their hand geometry characteristics to previously authorized data before allowing entry into restricted areas.

The standard CS-1 polls up to 16 stations, records on hard copy every entry and exit (by employee number, time, date and access control station) and

provides lockout and delisting by individual for up to 1,000 people.

All unsuccessful attempts to enter sound an audible alarm and the pertinent data is immediately printed out in red.

A CS-1 capable of controlling eight stations costs \$5,000 or leases for \$100/mo on a four-year contract.

The firm is at 408 Paulding Ave., 07647.

## Reader Carries Double Fiche

MENOMONEE FALLS, Wis. — Realist, Inc. has added a double fiche carrier for its Vantage reader line.

The carrier was designed to answer the requirements of various applications requiring simultaneous use of two standard 4-in. by 6-in. microfiche; such as in an application where one or two fiche might make up an entire system.

The carrier is priced at \$30 from the firm at N93 W16288 Megal Drive, 53051.

## Versatec 1250 Proofers Print 1,100 Char./Sec

CUPERTINO, Calif. — Printing hard-copy proofs prior to typesetting, the Versatec Matrix 1250 Proofer Series outputs galley at 1,100- or 500 char./sec.

Both models provide selectable print/no print of phototypesetter instructions. Both use 11-in. wide paper, either roll or fanfold.

The Matrix 1250 P Proofer is linked to the computer with controller interface for use in on-line proofing systems. It prints at 1,100 char./sec.

The unit accepts Ascii signal input, parallel and serial. Recommended operating rates are 600-, 1,200-, 2,400-, 4,800- and 9,600 bit/sec.

Optional serial synchronous interface for use with standard data sets is available.

The Matrix 1250 PTR Proofer System combines Matrix Proofer and paper tape reader to form a stand-alone off-line proofing system. Using Ascii (7- or 8-level) or TTS (6-level designed to user requirements) paper tape input, hard proof copy is printed at 500 char./sec.

Unit price of Matrix 1250 P Proofer is \$8,200; Matrix 1250 PTR Proofer System is \$10,000.

The firm is at 10100 Bubb Road, 95014.

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# COMPUTER INDUSTRY

## CI Notes

### Cal Data Sues DEC

LOS ANGELES — California Data Processors (Cal Data) has filed a countersuit against Digital Equipment Corp. (DEC) charging infringement of Cal Data's patent for a Language Independent Computer. Cal Data seeks an injunction and \$10 million in damages for past infringement.

In response to the patent infringement claim filed by DEC, Cal Data denied both the validity and infringement of the two DEC patents in suit.

A DEC spokesman said the firm considers the counterclaim to be "without foundation."

### Graham Licenses Asahi

GRAHAM, Texas — Graham Magnetics, Inc. has licensed Asahi Chemical Industry Co., Ltd. in the manufacture of magnetic tapes.

The agreement covers technological know-how of the manufacturing process. Asahi's manufacturing will be limited to Japan, but the firm retains sales rights for the Southeast Asia area.

Graham is to receive fixed fees for disclosure of its technology, and will also receive royalties on sales made by Asahi.

### Silicon Remains Tax Exempt

WASHINGTON, D.C. — The planned reclassification of silicon material as a chemical, rather than as a metal, will not affect its tariff status, according to the U.S. Tariff Commission.

Silicon, an essential material for the majority of semiconductor devices, is presently classified as a metal under the U.S. Tariff Schedule and finished semiconductors are imported under an exemption for metal products.

The commission is presently drafting new schedules to conform with the "Brussels Tariff Nomenclature," which classifies silicon as a chemical and is the standard nomenclature used in international trade.

### Supershorts

Leasepac Corp. has agreed to supply leasing agreements to Graham Magnetics, Inc. customers.

Electronic Processors, Inc. (EPI), Englewood, Colo., has filed a patent infringement suit against Redactron Corp. and Data General Corp. The suit claims both firms intentionally infringed a patented recording technique of EPI that is trademarked STR (speed tolerant recording).

Basic/Four Corp. has delivered its 1,000th small computer system to Lee Pharmaceuticals, South El Monte, Calif.

## Different Game Plan?

# Race Is On in Flexible Disk Drive Area

By Molly Upton  
Of the CW Staff

The stakes are high, the players numerous and the ground rules somewhat different in the floppy disk drive business as contrasted with higher-ticket DP products.

There is no question there will be a shakeout. The questions are who takes the bullet, when and how.

The floppy drive represents a slightly different type of animal than the larger peripherals.

It is a very low-ticket, low-profit-margin item, thus requiring volume production in order to trim costs even further to allow some semblance of profit.

Starting up production on a Detroit-like assembly line and making tooling and dies for the parts require capitalization, which is not going to yield a return above investment until well into volume shipments, most sources say.

Automated production facilities are not overly common in the DP industry, although one might expect to see numerical control machines doing a variety of jobs.

Testing is becoming more automated, but there is much hand assembly of PC boards and other components, as well as final assembly.

Thus, entering into large volume production of floppies generally requires a different setup than when a firm turns out larger disks.

Some of the larger firms with a broad range of products are counting on sur-

viving to at least the second iteration of the market, relying on other products to see them through the immediate future of lean if any profits.

Some observers are concerned about the smaller firms. On the one hand, they do not have the capital to back them until revenues exceed production costs,

## Analysis

and on the other, they might tie themselves too closely with a few big, low-priced contracts.

This could, they point out, be equally destructive if the small firms don't allow a sufficient margin for the firms' survival.

Some of the smaller firms have no doubt as to their viability and are already making a name for themselves by providing extensive customer support by extremely capable engineers. This, commented one industry observer, is something the small firms must do, and the large firms are more reluctant to do.

In this race of the masses, including the very large against the very small, the players all know one another, and there seems to be general, widespread moral support for some of the new firms.

The spirit of entrepreneurship is very much alive, and those who occupy desks at large corporations seem almost to be rooting for those who start out on their own.

Projections for the floppy market are somewhat hard to pin down, as there are the IBM 3740-compatible and non-compatible markets, and presumably most projections are made for using floppies in DP and related applications such as word processing.

Some figures quoted are 125,000 units shipped in 1977.

### Figures Low?

But if floppy drives take off, and no one seems willing to say they won't, and wend their way into consumer goods, such as home appliances, etc., then these figures are grossly inadequate.

As the prize seems larger, the temptation exists to pour more and more money into startup efforts and marketing and to wait longer for a return.

Certainly the ultimate design of the floppy drive and media are not yet here, although almost every independent will concede that IBM put some well thought-out features in its 3740.

But even IBM is changing features on its floppies, such as a ceramic head, acknowledged by some to be a beautifully simple, cost effective design. In the 3740, the diskette is dropped into a slot, rather than running the risk of being jammed or inserted askew in the horizontal position.

One maker said of all the media he tested, only IBM's tested 100%. Another said he hadn't had much trouble in this regard and found several suppliers acceptable.

The prices being quoted on large OEM bids are unrealistically low, one observer said, noting he expects the price to rise if those makers that survive the first shakeout want to continue in the business with something resembling a profit.

## Comptroller Extends Restrictions On Allowable Bank DP Activities

WASHINGTON, D.C. — The Office of the Comptroller of the Currency has requested the Central National Bank of Chicago, and by implication other banks, to get out of the subscription fulfillment business within three years.

The comptroller's office request is in keeping with the office's recent decision of what outside DP activities banks may legally engage in. The office was acting on a suit for a ruling from Hallmark Data Systems, Inc., a Shokie, Ill. service bureau.

### Since 1964

The Central National Bank had been offering a comprehensive subscription fulfillment service in competition with service bureaus since about 1964, according to Wayne D. Smart Jr., vice-president and chief counsel to the bank. He did not disclose the volume of subscription fulfillment business the bank had been doing.

Smart said the bank was considering the request to end its service and had not yet made a final decision.

In an interpretive ruling dated April 15, the comptroller's office noted, "A national bank may use data processing equipment and technology to perform for itself and others all services expressly or incidentally authorized under the statutes applicable to national banks."

### 'A Technology'

Data processing is merely a technology, and thus, "many services now commonly known as data processing services are not in fact new services simply because computers now are used to perform them."

The comptroller also stated banks may market programs or other products they develop in the course of their DP work, and may market excess time on their equipment "so long as the only involvement by the bank is furnishing the facility and necessary operating personnel."

But the comptroller deemed it "neither appropriate nor permissible for a bank to engage in a general data processing business."

## DP Trade Balance Sets Quarter Record

WASHINGTON, D.C. — The computer and business equipment industry's positive balance of trade reached record proportions during the first quarter.

The total U.S. balance of trade was a positive balance of \$1.31 billion, of which \$473.6 million was generated by the computer and business equipment sector.

The industry exported products totaling \$712.2 million in the first quarter, also a new record, according to figures compiled by the Computer and Business Equipment Manufacturers Association (Cbema).

The industry exported almost three times as much in dollar volume as was imported, for a ratio of 2.98, which compares with a ratio of 1.2 for all manufactured goods.

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All Components Group products are also used by Digital as components and peripherals in the PDP-8 and PDP-11 minicomputer systems, the most popular minis in the world; the products are compatible with all commonly-used minicomputers. Our components — like our computers — are designed to deliver maximum price/performance.

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United States, Puerto Rico, Canada and other countries overseas. These are the same facilities that have produced more minicomputers than anyone else, the facilities that manufacture and test the peripherals that support these computers. To meet your demands in the next year alone we're planning several new plants in the United States and Canada and retooling present production lines to Components Group specifications.

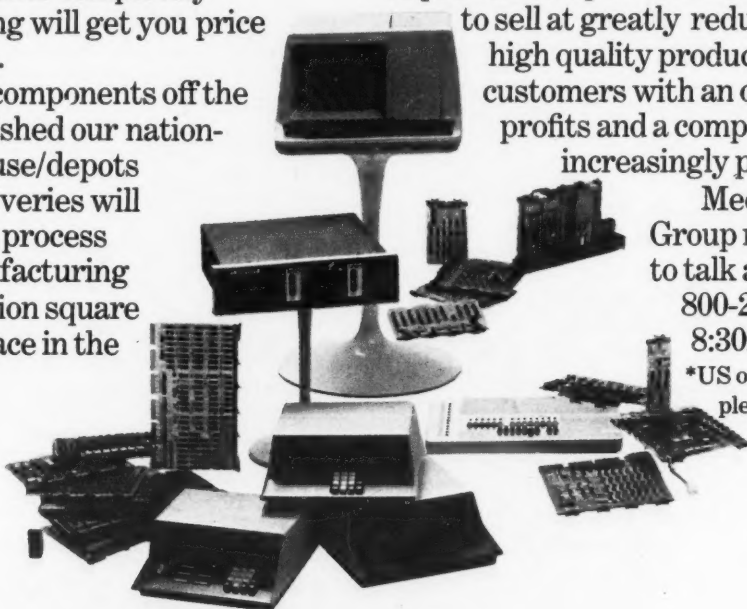
To deliver these components quickly and to maintain our high standards of reliability, the Components Group is planning a network of warehouses. At these depots, products meeting our rigid specifications will be stocked for off-the-shelf delivery.

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## Reaffirmed by 90/30

## Small Systems Spurred Univac's Growth

By Vic Farmer  
Of the CW Staff

NEW YORK — Univac's recent announcement of the 90/30 system [CW, June 26] reaffirms the company's aggressiveness, a characteristic proven by its continued growth over the past eight years, according to Gerald G. Probst, Univac president.

Univac announced its 9000 Series eight years ago for the smaller and medium-scale DP user after it had established the 1100 series. But breaking into the smaller systems really added to Univac's growth beginning about five years ago. "We have managed to top in the past year \$1.5 billion in revenue as of March 31," he noted.

This represented five continuous years of growth and the average growth rate compounded was slightly over 15%.

In comparison with fiscal year '73, Univac had some significant gains in 1974.

Commercial activity revenues were up over 15%, shipments were up over 30% and orders were up over 18%.

By the end of the year this gave a backlog for commercial products 23% over the previous year even in the light of the increased shipments made,

Probst said. "This advance in the commercial products sector will give us a good base to continue our growth and a solid platform from which to launch our fiscal '75 figures," he predicted.

Probst attributed the growth in the commercial area to customer satisfaction, a main objective over the past several years.

Last year Sperry Univac's base increased by 12%, which translates to \$5.5 billion currently installed. In the last three years, the firm has more than doubled the number of Fortune 500 customers utilizing Univac products, he said, and "this is indicative of the direction in which we are moving."

In the past three years, the firm has more than doubled the sales of commercial products in the North American Division, and in the same period tripled commercial sales in Europe.

To insure continued growth, Univac has acquired ISS to handle disk and other peripheral development, the RCA super-market checkout system and several distributors in Puerto Rico, Singapore and Hong Kong.

The distributors had limited resources and this move will provide an opportunity to expand the markets in Asia and the Caribbean, Probst said.

Another important step for Univac was the reorganization of



CW Photo by V.J. Farmer  
Probst

activities in all of Europe using four vice-president nationals to head up each branch. Probst expects this reorganization will allow decisions to further develop markets to be made in Europe.

Just a month ago Probst signed a cooperation agreement with the USSR's Science and Technology Minister.

## OEM Floppy Marketplace Seen Changing

By Molly Upton  
Of the CW Staff

SANTA CLARA, Calif. — Characteristics of the OEM floppy disk drive marketplace will change, observed A. Keith Plant, director of OEM marketing for Memorex.

Currently the key criteria are interface and price, but a year from now OEM customers will have designed interfaces to accept a variety of drives, and prices will increase on the OEM

level, he predicted.

There are six or eight viable contenders in the marketplace, many of whom are undercapitalized, he said. Several large contracts are currently up for grabs, and the prices bid by some contestants are reportedly as low as \$250 per drive without PC board, he said.

Keith observed it is quite possible a small firm could grab large contracts, but if it did, it would run the risk of tying up its entire production capability on a very low profit item. This could kill the small, undercapitalized firm, he warned.

A year from now the second market for floppy drives will emerge, much of it from demand to second source the original contract suppliers, he continued.

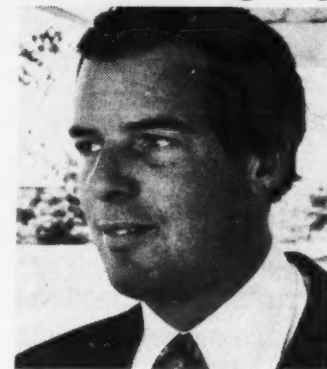
## Makes Media

Memorex makes its own media as well as heads and drives. The firm offers two drives and media — the 651 and diskette, which are not IBM compatible, and the 652 and markette, which are IBM 3740-compatible.

Shipments of 651 drives in May totaled 700 units and Plant estimated shipments for 1974 will be in the 9,000 to 10,000 range.

Right now the 651 represents Memorex's chief source of revenue from its OEM disk products, whereas the 651 and Memorex's 2314-type drive, the 660, should tie for the honors by the end of the year.

By the end of 1975, the 652,



CW Photos by M. Upton  
Plant

the 660 and 651 should each contribute a third of OEM disk revenues, Plant said.

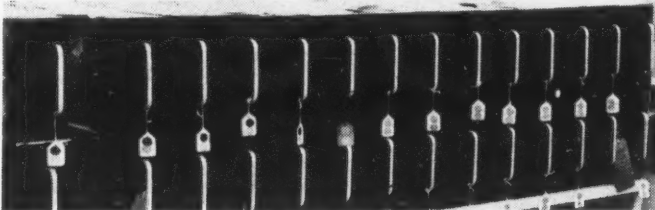
The Memorex 651 uses a flexible disk that has a thicker coating than that used by IBM, and has 32 sector holes and one index hole around the disk periphery.

The 651 drive and diskette were designed as a complete unit, Plant noted. Memorex warrants the head for 10,000 hours and the diskette for one million passes per track.

Memorex started producing the 652 in March and is beginning volume shipments.

Markets for the drives include word processing equipment, calculators, terminals and data entry systems, Plant noted.

In addition to its 2314-type drives, Memorex is exploring the possibility of 3330-type units in the 100M- to 200M-byte range, he said.



652 Flexible Disk Drives

## Spitters Loses Bid For Congress

SAN JOSE, Calif. — A Memorex founder, Laurence L. Spitters, who recently stepped down as top official of the company, lost a bid to win the Democratic nomination for the 12th district congressional seat.

Spitters came in third with 8,873 votes. The winner was Santa Clara Mayor Gary Gillmor, who received 15,780 votes. Second was Thomas Skornia, 13,143 votes, who has been a

spokesman for several local semiconductor companies.

## Intel Acquires IPL

SAN FRANCISCO — Intel Corp. has acquired IPL Data Services, Ltd., a firm specializing in the development of computer software for the retail industry.

"This acquisition allows the data services group to enter the retail industry," said William H. Bird, group president.

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## 'Good-News Gong' Struck for Orders

## HP's 3000 Sales Exceeding Quota

By Molly Upton  
Of the CW Staff

CUPERTINO, Calif. — Sales of Hewlett-Packard's (HP) 3000 system are exceeding quota, according to Nev Griffin, product manager. To date, the firm has installed over 40 systems in non-HP locations, he said, and is shipping about six a month.

There are two versions of the machine, with configurations designed for the two operating systems, although users are interchanging the software on their systems, he noted.

The 3000 Model 200 is the older version, with MPE software designed for multiprogramming, while the 100, with the new MPET, is designed for time-sharing.

While only released this month, one 100 system has already been sold, Griffin added.

#### 'Image' Language

HP also offers a data management language called "Image."

HP considers its competition for the 3000 to come from Digital Equipment's PDP-11/45 with RSTS/11E, he said.

System prices start at \$129,500 and typically run somewhere around \$200,000, Griffin said.

HP is very interested in the \$100,000 to \$125,000 market, he said.

"We know there's a substantial market there, and we feel we have the technology to bring the price down."

One step that will lead to price reductions, as well as assurance of quality products, is manufacturing more of its own peripherals, Griffin noted.

HP now makes its own cartridge disks and tape drives and has started manufacturing printers under a license from Tally. The firm is investigating making larger disks and possibly terminals as well, he said.

Although intended for the end user, HP has signed its first OEM contract for the 3000. The existing sales force will handle OEM sales for the unit, Griffin said.

Since HP has an extensive sales force in the electronics industry, it is putting that to work selling HP 3000s in its ordinary industrial accounts, Griffin said, and

this is working out well.

So far 3000s are installed principally in education and industrial locations, but have also been installed in financial and medical sites.

May was the best month so far for sales of the 3000 since its reintroduction last November, he said.

About 20% of the installed base is outside the U.S.

HP would like to double the base in fiscal 1975, and Griffin said he felt confident this would be done.

Griffin has found that company-sponsored day-long seminars around the country have yielded good results. HP conducts an overview session on the system in the morning, and then brings in technical personnel in the afternoon, as well as a local user, to explain the machine's capabilities and applications.

HP's Data Systems Division has installed a "good-news gong" that is struck every time an order is received for a 3000.

"It really wakes people up," Griffin added.

## Contracts

TORRANCE, Calif. — The City of Torrance has awarded Computer Sciences Corp. (CSC) a three-year facilities management contract.

The main feature of the CSC program is the conversion of existing operations to distributed processing, which will afford the community of 140,000 the type of management information system usually available only to large cities, the city claimed.

CSC will also implement a program management system to provide timely data on city programs in terms of budget, expenditures and performance. Operations which require large amounts of processing, report printing or data storage will be handled by CSC's time-sharing network Infonet.

The contract stipulates that CSC will design programs to

meet the needs of each department, rather than forcing the various departments to adapt to ready-made computer packages.

#### Other Contracts

Computer Election Systems, Inc. has been awarded a contract by the Board of Supervisors of Los Angeles County to install six CES 700 Ballot Multiplexer systems for the rapid transfer of vote data from punch cards to magnetic tape.

MetPath, Inc. has been awarded a contract by Pharmacopathics to process all administrative and medical reporting functions.

Teleprocessing Industries has received a \$1.5 million contract from TRT Telecommunications Corp. to design and install an

international message-switching processing system in TRT's Fort Lauderdale, Fla., technical operations center.

Control Data Corp. has been awarded a \$7.2 million contract by the U.S. Marine Corps to cover production of 19 AN/TYC-5A high-speed data communications terminals and associated logistics support.

Univac has received a contract from the Federal Aviation Administration for automation of FAA's Anchorage Air Route Traffic Control Center.

Information Displays, Inc. has been awarded a contract by Sperry Rand Corp. to build a 21-in. random position Situation Display to be incorporated into the Computer Aided Operations Research Facility of the Na-

## POSITION ANNOUNCEMENTS

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### EXECUTIVE DIRECTOR OF THE COMPUTER NETWORK University of Nebraska System

The University of Nebraska seeks to fill a major administrative position at the University-wide System level. The Executive Director of the Computer Network is responsible for the entire range of computer activities in the University of Nebraska. Instructional, research and administrative computing services are provided by the Computer Network. The Executive Director should have experience in managing a large computer service organization, preferably in a major university. Familiarity with modern computing equipment and networking is essential. For further information, including a position description, contact William C. Erskine, Executive Vice President for Administration, University of Nebraska, 3835 Holdrege, Lincoln, Nebraska 68503. Inquiries will be responded to until July 15, 1974. The University of Nebraska is an Equal Opportunity/Affirmative Action Employer.

## Director of University Computing Center

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- Take charge of Univac 1108 — IBM 370/145 installation.
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This experience must be in the areas of System Generation and tuning, OS Internals, JCL and TSO. Also, experience in IMS, CICS and evaluation and benchmarking of various peripherals and software products is desirable.

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## Position Announcements

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Our client companies assume all fees.





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## PROGRAMMER/ANALYSTS (2)

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Will design systems and write applications programs for customers in a wide variety of discipline (Engineering, Finance, or Marketing). Also, aid in conversion of programs from outside computer services to in-house equipment. Prefer B.S. in Engineering or Computer Science with 1-2 years programming experience. Should be proficient in Fortran, knowledge of BASIC, COBOL and experience with Time Sharing Systems would be desirable.

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Cummins has global operations and has doubled its sales in the last five years. We are headquartered in a progressive midwestern town with superior schools and a relaxed life-style. The Company provides excellent fringe benefits and competitive salaries. Send resume and salary requirements to: F.J. Loughrey, Cummins Engine Company, 1000 Fifth Street, Columbus, Indiana 47201.

**Cummins**

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The department is seeking candidates for positions at the rank of instructor and assistant professor. The latter must have a Ph.D. in Computer Science or related field and an interest in computability as well as in systems software and data organization. Industrial experience and teaching ability is highly desirable. The candidates for the instructor position will teach beginning programming language courses such as BASIC, FORTRAN, etc. and should have a master's degree. This position is not tenurable.

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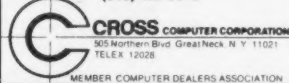
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## Wiltek, Milgo, Penril, Comten

## Data Communications Firms' Profits Rise

Four data communications equipment firms — Wiltek, Milgo, Penril and Comten — have reported improved results in recent periods.

Wiltek, Inc.'s earnings for the six months ended April 30 more than doubled over those of a year ago, to \$242,000 or 18 cents a share compared with \$99,000 or 7 cents a share in the 1973 period.

Revenues totaled \$8.1 million compared with \$4.7 million in the same year-ago period.

Second quarter earnings reached \$100,000, or 8 cents a share, up from \$61,000 or 4 cents a share last year. Revenues in the three months grew to \$4.4 million compared with \$2.7 million in the 1973 quarter.

Interest expenses have climbed almost \$400,000 from the first

six months of 1973 to the same period in 1974, the firm said.

Wiltek plans to level off sales during the next several months in order to minimize the effect of high interest rates and tight credit, President Robert J. Amman said.

This move will provide time for the company's internal cash flow to catch up with its requirements and limit the need for additional external financing, he said.

### Quarter Declines

Milgo Electronic Corp.'s six-month results were also improved over those of a year ago. However, second quarter earnings declined slightly from the year-ago figure.

The decrease in sales volume in the second 1974 quarter com-

pared with the first quarter was due to production difficulties, the firm said.

For the six months, Milgo earned \$1.6 million or \$1.03 a share compared with \$1.5 million or 93 cents a share in the year-ago period.

Revenues climbed to \$13.6 million compared with \$10.1 million last year.

In the second quarter, Milgo's earnings totaled \$784,000 or 50 cents a share compared with \$787,000 or 49 cents a share. Revenues totaled \$6.6 million compared with \$5.3 million a year ago.

At Comten, Inc., first-quarter revenues rose to \$2.3 million from \$1.5 million with a pretax profit of \$2,701 compared with a loss of \$60,642 or 3 cents a share in the year-ago period.

System rentals and maintenance revenues were about \$439,000 greater than in the same 1973 period, a significant factor in the improved results, observed President Donald J. Herman.

Twenty-three communications computer systems were delivered during the three months, equivalent to about 50% of total deliveries for all of 1973, he said.

### Trend Continues

The profitable trend established in the fourth quarter at Penril Corp. continued into the first half ended Jan. 1.

Earnings rose to \$164,980 or 13 cents a share, including a \$72,690 tax credit, compared with a loss of \$131,191 or 11 cents a share in the year-ago period.

The Electro-Metrics Division, purchased from Fairchild Camera and Instrument Corp. last August, contributed \$78,964 towards earnings.

Revenues rose 282% to \$1.9 million from \$687,106 last year.

The firm changed its name from Penril Data Communications, Inc. in order to reflect a wider range of products.

## Pertec Posts Loss After Write-Off; Revenues Grow in Nine Months

EL SEGUNDO, Calif. — Write-off of a line printer in the third quarter adversely affected Pertec Corp.'s third-quarter and nine-month earnings compared with those of a year ago.

Revenues during both periods continued to climb.

However, after totally writing off the costs of closing down the printer line, Pertec is looking forward to increased revenues and profits during the fourth quarter, President Ryal R. Poppa said.

In the third quarter ended March 29, revenues grew to \$8.4 million from \$7.5 million, but the firm lost \$285,000 or 9

earnings of \$435,000 or 14 cents a share in the same year-ago period.

Income from operations during the period declined to \$232,000 compared with \$562,000 a year ago. The loss from the printer operations and their disposal was \$517,000.

Nine-month revenues rose from \$19.4 million in 1973 to \$23.5 million this year. Pertec earned \$376,000 or 12 cents a share compared with \$1.1 million or 35 cents a share last year in the nine months.

Income from operations declined to \$1.2 million from \$1.5 million. In the nine months, the loss from printer operations and their disposal totaled \$1.1 million.

Delays in planned shipments of the firm's shared processor and CRT terminal until contract negotiations were complete also adversely impacted third-quarter earnings, Poppa said. Shipment of these products are now on schedule, he noted.

## Optical Scanning Lists Third-Quarter Gain

NEWTOWN, Pa. — The profitable trend shown in the third quarter at Optical Scanning Corp. is also evident in the nine-month results compared with losses in both 1973 periods.

In the three months ended March 31, the firm earned \$424,098 or 64 cents a share, of which \$373,294 stemmed from special credits. This compares with a loss of \$76,417 or 12 cents a share a year ago.

Revenues in the third quarter grew 32% to \$4.8 million compared with \$3.6 million in 1973.

In the nine months, earnings jumped to \$574,245 or 87 cents a share, of which \$439,894 came from special credits. This compares with a loss of \$226,273 in the 1973 period.

Revenues totaled \$14.2 million compared with \$10.4 million in the same 1973 period.

## Memorex Considers Additional Charges

SANTA CLARA, Calif. — Memorex Corp. is considering additional charges of up to \$4 million in the current quarter, Robert C. Wilson, chairman and president, said at the firm's annual meeting.

"A prudent company tries to be conservative. There's nothing dramatic, just a relook at our condition," Wilson said later, noting the write-off would not involve any particular area.



## OMNITEC ANNOUNCES OFF-THE-SHELF DELIVERY

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## OMNITEC CORPORATION



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## Earnings Reports

| GENERAL AUTOMATION<br>Three Months Ended May 4 |            |            |      |
|--|------------|------------|------|
| 1974   | 1973       | 1974       | 1973 |
| Shr Ernd                                       | \$ .43     | \$ .23     |      |
| Revenue  | 15,233,000 | 7,767,000  |      |
| Earnings                                       | 1,089,000  | 564,000    |      |
| 9 Mo Shr                                       | 1.15       | .91        |      |
| Revenue  | 41,367,000 | 19,831,000 |      |
| Tax Cred                                       | .....      | 586,000    |      |
| Earnings                                       | 2,910,000  | 2,015,000  |      |

| COMPUTER INSTRUMENTS<br>Four Months Ended April 19 |             |             |      |
|--|-------------|-------------|------|
| 1974   | 1973        | 1974        | 1973 |
| Revenue  | \$1,539,837 | \$1,325,094 |      |
| Loss   | 127,866     | 80,863      |      |

| DATA TECHNOLOGY<br>Year Ended April 27 |            |            |      |
|--|------------|------------|------|
| 1974                                   | 1973       | 1974       | 1973 |
| Shr Ernd                               | \$ .60     | \$ .10     |      |
| Revenue                                | 17,351,056 | 12,941,908 |      |
| Earnings                               | 730,106    | 117,469    |      |

| WAVETEK<br>Three Months Ended April 13 |           |           |      |
|--|-----------|-----------|------|
| 1974                                   | 1973      | 1974      | 1973 |
| Shr Ernd                               | \$ .17    | \$ .15    |      |
| Revenue                                | 2,481,700 | 1,991,400 |      |
| Earnings                               | 145,700   | 128,900   |      |
| 6 Mo Shr                               | \$ .40    | \$ .33    |      |
| Revenue                                | 5,325,300 | 4,264,100 |      |
| Earnings                               | 346,300   | 284,600   |      |

| NATIONAL SYSTEMS<br>Three Months Ended March 31 |             |           |      |
|---|-------------|-----------|------|
| 1974  | 1973        | 1974      | 1973 |
| Shr Ernd  | .....       | \$ .06    |      |
| Revenue   | \$2,230,000 | 2,959,000 |      |
| Disc Op   | (48,000)    | 16,000    |      |
| Spec Cred                                       | 101,000     | .....     |      |
| Earnings  | 65,000      | 86,000    |      |

a-Restated to reflect discontinued operations. b-Includes tax credit and gain from cumulative effect on prior year of change in accounting.

| INFOREX<br>Three Months Ended March 29 |              |           |      |
|--|--------------|-----------|------|
| 1974                                   | 1973         | 1974      | 1973 |
| Shr Ernd                               | .....        | \$ .29    |      |
| Revenue                                | \$10,798,000 | 7,753,000 |      |
| Tax Cred                               | .....        | 339,000   |      |
| Earnings                               | (92,000)     | 813,000   |      |

| TECHANALYSIS<br>Three Months Ended March 31 |         |         |      |
|---|---------|---------|------|
| 1974  | 1973    | 1974    | 1973 |
| Shr Ernd                                    | \$ .06  | \$ .05  |      |
| Revenue                                     | 354,863 | 340,912 |      |
| Earnings                                    | 30,400  | 25,000  |      |

| DATATAB<br>Three Months Ended March 31 |           |           |      |
|--|-----------|-----------|------|
| 1974                                   | 1973      | 1974      | 1973 |
| Shr Ernd                               | \$ .07    | \$ .02    |      |
| Revenue                                | 1,252,440 | 1,182,786 |      |
| Earnings                               | 51,694    | 12,788    |      |

| DATUM<br>Three Months Ended March 31 |           |           |      |
|--------------------------------------|-----------|-----------|------|
| 1974                                 | 1973      | 1974      | 1973 |
| Shr Ernd                             | \$ .08    | \$ .06    |      |
| Revenue                              | 3,505,721 | 1,993,211 |      |
| Earnings                             | 124,017   | 78,799    |      |

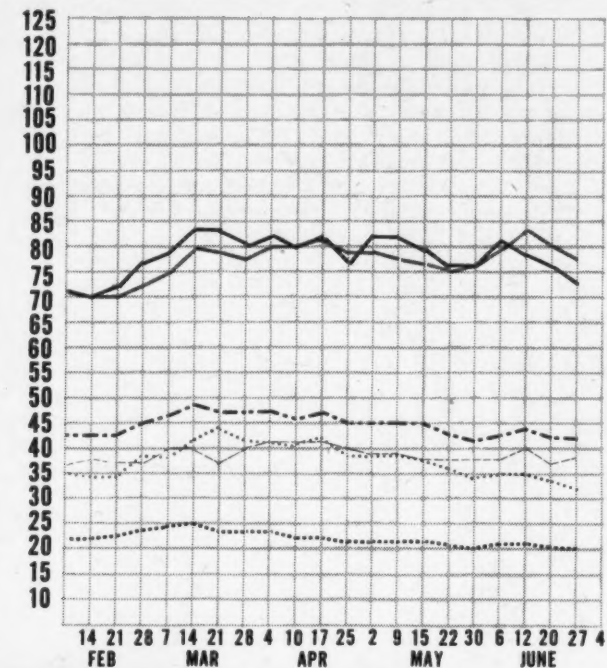
| AMPEX<br>Year Ended April 27 |             |             |      |
|------------------------------|-------------|-------------|------|
| 1974                         | 1973        | 1974        | 1973 |
| Shr Ernd                     | \$ .50      | \$ .34      |      |
| Revenue                      | 281,358,000 | 258,036,000 |      |
| Disc Op                      | .....       | (260,000)   |      |
| aSpec Cred                   | 1,320,000   | 2,781,000   |      |
| Earnings                     | 5,426,000   | 3,654,000   |      |
| 3 Mo Shr                     | .12         | .26         |      |
| Disc Op                      | .....       | (541,000)   |      |
| Spec Chg                     | b10,000     | .....       |      |
| Earnings                     | 1,318,000   | 2,714,000   |      |

a-In 1974, from tax-loss carryforward credit; in 1973, gain from sale of subsidiary. b-Loss from utilization of net operating loss carryforward.

| DIGITAL COMPUTER CONTROLS<br>Year Ended Feb. 28 |           |           |      |
|---|-----------|-----------|------|
| 1974  | 1973      | 1974      | 1973 |
| Shr Ernd  | \$ .07    | .....     |      |
| Revenue   | 6,251,983 | 3,694,203 |      |
| Earnings  | 110,129   | (345,991) |      |

## COMPUTERWORLD Computer Stocks Trading Indexes

Computer Systems      Software & EDP Services  
Peripherals & Subsystems      Leasing Companies  
Supplies & Accessories      CW Composite Index



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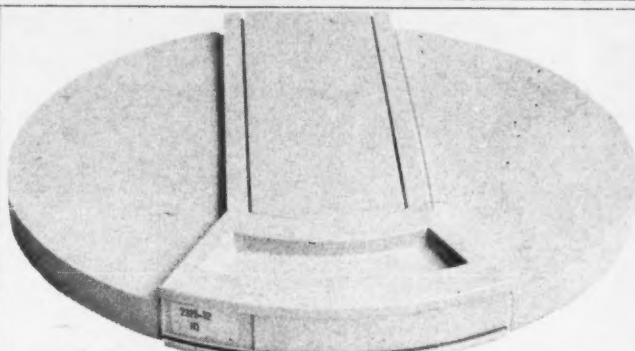
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## Computerworld Stock Trading Summary

All statistics compiled,  
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TRADE\*QUOTES, INC.  
Cambridge, Mass. 02139

| PRICE                    |         |         |        |        |  |
|--------------------------|---------|---------|--------|--------|--|
| 1973-74                  | CLOSE   | WEEK    | WEEK   |        |  |
| RANGE                    | JUN 27  | NET     | PCT    |        |  |
| (1)                      | 1974    | CHNGE   | CHNGE  |        |  |
| COMPUTER SYSTEMS         |         |         |        |        |  |
| N BURROUGHS CORP         | 49-126  | 98 1/2  | -5     | -4.8   |  |
| N COLLINS RADIO          | 16-26   | 24 3/4  | 0      | 0.0    |  |
| O COMPUTER AUTOMATION    | 5-20    | 11 3/4  | -7/8   | -6.9   |  |
| N CONTROL DATA CORP      | 25-62   | 25      | -1 7/8 | -6.9   |  |
| N DATA GENERAL CORP      | 28-49   | 32 3/4  | -1 1/8 | -3.3   |  |
| O DATAPoint CORP         | 10-21   | 10 1/2  | -3/4   | -6.6   |  |
| O DIGITAL COMP CONTROL   | 2-6     | 2 3/4   | -1/4   | -8.3   |  |
| N DIGITAL EQUIPMENT      | 73-121  | 103     | -7 1/2 | -6.7   |  |
| A ELECTRONIC ASSOC.      | 2-9     | 2 1/8   | -3/8   | -15.0  |  |
| N ELECTRONIC ENGINEER.   | 6-14    | 8       | -3/4   | -8.5   |  |
| N FOXBORO                | 23-48   | 29      | +1/4   | +0.8   |  |
| O GENERAL AUTOMATION     | 22-55   | 35 1/2  | -1/4   | -0.6   |  |
| O GRI COMPUTER CORP      | 1-3     | 3/4     | -1/8   | -14.2  |  |
| N HEWLETT-PACKARD CO     | 70-99   | 83 7/8  | -2     | -2.3   |  |
| N HONEYWELL INC          | 55-139  | 46 7/8  | +1 5/8 | +2.9   |  |
| N IBM                    | 211-340 | 212     | -1 3/4 | -0.8   |  |
| O INTERDATA INC          | 7-22    | 15 3/4  | -4 5/8 | -22.6  |  |
| O MICRON DATA CORP       | 2-10    | 4 1/8   | -1/2   | -10.8  |  |
| N NCR                    | 27-46   | 32 1/8  | 0      | 0.0    |  |
| N RAYTHEON CO            | 22-39   | 32      | -1/8   | -0.3   |  |
| N SINGER CO              | 29-74   | 29 1/4  | -3/8   | -1.2   |  |
| N SPERRY RAND            | 36-56   | 38 3/8  | +1/2   | +1.3   |  |
| A SYSTEMS ENG. LABS      | 1-8     | 1 5/8   | -1/4   | -13.3  |  |
| N TEXAS INSTRUMENTS      | 83-138  | 91 7/8  | -1/2   | -0.5   |  |
| O ULTIMAC SYSTEMS INC    | 1-11    | 1 1/2   | +1/8   | +9.0   |  |
| N VARIAN ASSOCIATES      | 9-20    | 8 5/8   | -3/8   | -4.1   |  |
| N WANG LABS.             | 11-34   | 12 1/4  | -1/2   | -3.9   |  |
| N XEROX CORP             | 106-169 | 115 1/4 | -2 1/8 | -1.8   |  |
| LEASING COMPANIES        |         |         |        |        |  |
| A BOOTHE COMPUTER        | 1-5     | 1 1/8   | 0      | 0.0    |  |
| O BRESNAHAN COMP.        | 1-2     | 2 1/8   | 0      | 0.0    |  |
| O COMDISCO INC           | 2-17    | 3 1/2   | +1/4   | +7.6   |  |
| A COMMERCE GROUP CORP    | 3-6     | 3 5/8   | -1/8   | -3.3   |  |
| O COMPUTER EXCHANGE      | 1-1     | 1 1/8   | 0      | 0.0    |  |
| A COMPUTER INVS TRS GRP  | 1-8     | 1 1/4   | -3/8   | -23.0  |  |
| O COMP. INSTALLATIONS    | 1-2     | 1       | 0      | 0.0    |  |
| M DATRONIC RENTAL        | 1-3     | 1       | 0      | 0.0    |  |
| A DCL INC                | 0-3     | 3/8     | 0      | 0.0    |  |
| N DPF INC                | 3-9     | 3 3/8   | -1/4   | -6.8   |  |
| O EDP RESOURCES          | 1-3     | 3 1/4   | 0      | 0.0    |  |
| A GRANITE MGT            | 1-6     | 1 5/8   | +1/4   | +18.1  |  |
| A GREYHOUND COMPUTER     | 3-6     | 3 3/8   | -1/8   | -3.5   |  |
| A ITEL                   | 4-12    | 4       | -1/4   | -5.8   |  |
| N LFASCO CORP            | 8-18    | 9 1/8   | -1/4   | -2.6   |  |
| O LFASPC CORP            | 1-8     | 1 1/4   | 0      | 0.0    |  |
| O LECTRO MGT INC         | 1-2     | 1/4     | -1/8   | -33.3  |  |
| O NRG INC                | 3-15    | 3 1/8   | 0      | 0.0    |  |
| A PIONEER TEX CORP       | 2-10    | 3       | 0      | 0.0    |  |
| A ROCKWOOD COMPUTE       | 1-3     | 3/4     | 0      | 0.0    |  |
| N U.S. LEASING           | 12-36   | 12 3/4  | -1 1/2 | -10.5  |  |
| SOFTWARE & EDP SERVICES  |         |         |        |        |  |
| O ADVANCED COMP TECH     | 1-2     | 1       | 0      | 0.0    |  |
| A APPLIED DATA RES.      | 2-4     | 2 1/8   | +1/4   | +13.3  |  |
| O APPLIED LOGIC          | 1-3     | 1 1/8   | 0      | 0.0    |  |
| N AUTOMATIC DATA PROC    | 26-94   | 26 3/8  | -2 5/8 | -9.0   |  |
| O BRANSON APPLIED SYST   | 1-1     | 3/8     | +1/8   | +50.0  |  |
| O CENTRAL DATA SYSTEMS   | 3-9     | 4 1/4   | 0      | 0.0    |  |
| O COMPUTER DIMENSIONS    | 1-5     | 1 7/8   | +1/8   | +7.1   |  |
| O COMPUTER HORIZONS      | 1-6     | 1 3/4   | -1/4   | -12.5  |  |
| O COMPUTER NETWORK       | 1-5     | 1 1/2   | +3/8   | +33.3  |  |
| N COMPUTER SCIENCES      | 2-6     | 2 3/4   | 0      | 0.0    |  |
| O COMPUTER TASK GROUP    | 1-2     | 1/2     | +1/8   | +33.3  |  |
| O COMPUTER TECHNOLOGY    | 1-3     | 1/2     | 0      | 0.0    |  |
| O COMPUTER USAGE         | 3-9     | 2 7/8   | -5/8   | -17.8  |  |
| O COMRESS                | 1-2     | 1/2     | 0      | 0.0    |  |
| O COMSHARE               | 2-9     | 2 3/4   | -3/8   | -12.0  |  |
| N CORDURA CORP           | 2-15    | 2 3/4   | -5/8   | -18.5  |  |
| O DATATAR                | 1-4     | 2       | 0      | 0.0    |  |
| A ELECT COMP PROG        | 1-2     | 1/4     | +1/8   | +100.0 |  |
| N ELECTRONIC DATA SYS.   | 12-56   | 15 1/4  | -1/4   | -1.6   |  |
| O INFONATIONAL INC       | 1-2     | 1/2     | 0      | 0.0    |  |
| O I.O.A. DATA CORP       | 1-1     | 3/8     | 0      | 0.0    |  |
| O IPS COMPUTER MARKET    | 1-5     | 3/4     | 0      | 0.0    |  |
| O KEANE ASSOCIATES       | 2-5     | 3 1/4   | -1/4   | -7.1   |  |
| O KEYDATA CORP           | 3-12    | 2 7/8   | -1/8   | -4.1   |  |
| O LOGICOM                | 2-7     | 3 1/8   | 0      | 0.0    |  |
| A MANAGEMENT DATA        | 1-5     | 1 1/2   | +1/4   | +20.0  |  |
| O NATIONAL CSS INC       | 16-42   | 16      | -1 1/2 | -8.5   |  |
| O NATIONAL COMPUTER CO   | 1-1     | 1/4     | 0      | 0.0    |  |
| O NATIONAL INFO SVCS     | 1-2     | 1/8     | 0      | 0.0    |  |
| A ON LINE SYSTEMS INC    | 12-31   | 27 1/2  | -1 3/8 | -4.7   |  |
| N PLANNING RESEARCH      | 2-7     | 2 1/2   | -1/4   | -9.0   |  |
| O PROGRAMMING METHODS    | 17-25   | 17      | 0      | 0.0    |  |
| O PROGRAMMING & SYS      | 1-1     | 5/8     | -1/8   | -16.6  |  |
| O RAPIDATA INC           | 2-24    | 2 5/8   | -1/8   | -4.5   |  |
| O SCIENTIFIC COMPUTERS   | 1-3     | 7/8     | 0      | 0.0    |  |
| O SIMPLICITY COMPUTER    | 1-4     | 3/4     | -1/8   | -14.2  |  |
| O TCC INC                | 1-1     | 1/4     | 0      | 0.0    |  |
| O TYMSHARE INC           | 6-13    | 9 7/8   | -3/4   | -7.0   |  |
| O UNITED DATA CENTER     | 3-6     | 2 3/4   | 0      | 0.0    |  |
| A UPS SYSTEMS            | 2-8     | 2 1/2   | +1/8   | +5.2   |  |
| N WYLY CORP              | 3-11    | 3 1/4   | -1/8   | -3.7   |  |
| PERIPHERALS & SUBSYSTEMS |         |         |        |        |  |
| N ADDRESSOGRAPH-MULT     | 5-34    | 4 3/4   | -3/8   | -7.3   |  |
| O ADVANCED MEMORY SYS    | 3-23    | 3 1/4   | +1/8   | +4.0   |  |
| N AMPEX CORP             | 3-7     | 3 1/4   | -1/8   | -3.7   |  |
| O ANDERSON JACOBSON      | 2-6     | 2 3/4   | +1/4   | +10.0  |  |
| O BEEHIVE MEDICAL ELFC   | 3-10    | 3 1/2   | 0      | 0.0    |  |
| A BOLT, BERANEK & NEW    | 6-12    | 7 1/2   | -1/8   | -1.6   |  |
| N BUNKER-RAMO            | 6-18    | 6 1/8   | 0      | 0.0    |  |
| A CALCOMP                | 5-16    | 8 1/4   | -1/2   | -5.7   |  |
| O CAMBRIDGE MEMORIES     | 7-17    | 7 5/8   | +1/4   | +3.3   |  |
| O CENTRONICS DATA COMP   | 13-38   | 16      | -1 1/4 | -7.2   |  |
| O CODEX CORP             | 8-19    | 12      | -1/4   | -2.0   |  |
| O COGNITRONICS           | 1-3     | 1       | 0      | 0.0    |  |
| SUPPLIES & ACCESSORIES   |         |         |        |        |  |
| O BALTIMORE BUS FORMS    | 4-9     | 4 1/4   | -3/4   | -15.0  |  |
| A BARRY WRIGHT           | 5-13    | 5       | 0      | 0.0    |  |
| O CYBERMATICS INC        | 1-3     | 1 1/4   | +1/8   | +11.1  |  |
| A DATA DOCUMENTS         | 17-54   | 50      | +3/4   | +1.5   |  |
| O DUPLEX PRODUCTS INC    | 6-17    | 15 5/8  | +7/8   | +5.9   |  |
| N ENNIS BUS. FORMS       | 5-8     | 6 1/4   | -1/4   | -3.8   |  |
| O GRAHAM MAGNETICS       | 7-20    | 7 1/2   | -1/4   | -3.2   |  |
| O GRAPHIC CONTROLS       | 7-12    | 9       | -3/4   | -7.6   |  |
| N 3M COMPANY             | 69-91   | 73 5/8  | -1 1/8 | -1.5   |  |
| O MOORE CORP LTD         | 42-65   | 50      | -2 1/4 | -4.3   |  |
| N NASHUA CORP            | 32-58   | 39      | +3/8   | +0.9   |  |
| O REYNOLDS & REYNOLD     | 23-51   | 23      | -1     | -4.1   |  |
| O STANDARD REGISTER      | 11-20   | 14 3/4  | 0      | 0.0    |  |
| A TAR PRODUCTS CO        | 6-23    | 6       | -1/4   | -4.0   |  |
| N UARCO                  | 15-23   | 20 5/8  | -1/8   | -0.6   |  |
| A WASH MAGNETICS         | 5-8     | 5       | -3/8   | -6.9   |  |
| N WALLACE BUS FORMS      | 14-26   | 20 3/4  | -2 1/4 | -9.7   |  |

EXCH: N=NEW YORK A=AMERICAN P=PHIL-BALT-WASH  
L=NATIONAL M=MIDWEST O=OVER-THE-COUNTER  
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID  
(1) TO NEAREST DOLLAR



# COMPUTER MACHINERY/REMCOM

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## Datamoving

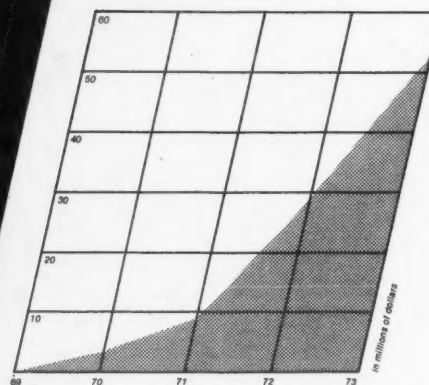
Data isn't born in computers. And it doesn't die there. Data moves. From where people create it... to where people use it. • Data moves from sales orders and stock orders and time cards... to invoices and inventory listings and paychecks. • On the way, it's organized, balanced, validated, edited, enhanced, packaged, and shipped to a computer. • That's datamoving. It goes far beyond the old concept of data entry. • Outbound from computers, data moves to branch offices, warehouses, manufacturing plants — out to where the people are who fill the orders, manage the inventories, and take home the paychecks. • In 1969 Computer Machinery pioneered a new field called shared-processor data entry — using minicomputers to cut the cost of data preparation by 30-50%. By adding data communications hardware and software to these systems, we also gained an initial, rapidly growing position in the remote batch terminal field. • During this same period, Remcom began supplying terminal systems for remote batch processing networks — making it possible for one central computer to serve many outlying locations. • Computer Machinery has become the world leader in its field. Remcom has become the second-largest independent in its field. • On June 7, 1974, through acquisition, the two seasoned pioneers joined forces to create a new force in datamoving. • We move data across town, across continents, or across oceans. We move it via disks, tapes, punched cards, and communications lines. We move it from keying centers to computers to output printers. We move it in large batches or small ones. • Datamoving is the fastest-growing sector of the computer industry. We helped create it. And we're moving with it.

### Computer Machinery Corporation

2500 Walnut Avenue, Marina del Rey  
Post Office Box 92300  
Los Angeles, California 90009

Send for our 1973 Annual Report. Written before we acquired the Remcom business, it describes the natural evolution of our shared-processor product line into the data communications field.

Computer Machinery Corporation  
Annual Revenues



#### Shared-Processor Data Entry Systems

Computer Machinery

Inforex

Mohawk Data Sciences

Entrex

General Computer Systems

Consolidated Computer

Honeywell

GTE Information Systems

4 Phase

#### Remote Batch Terminal Systems

IBM

Data 100

Remcom

Harris-Intertype

Univac

Control Data

Burroughs

Mohawk Data Sciences

Computer Machinery